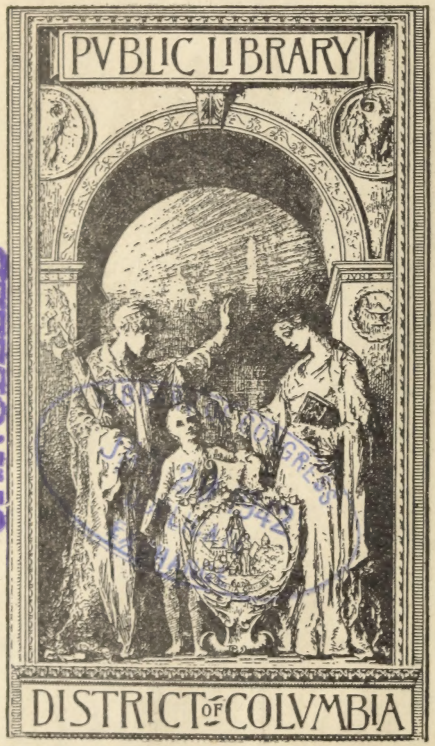
WHITE'S SELBORNE

WOODRIDGE



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THE NATURAL HISTORY OF SELBORNE

VOL. I

White's House "The Wakes," from the garden.

NATURAL HISTORY OF SELBORNE & OBSERVATIONS ON NATURE

BY GILBERT WHITE

WITH THE TEXT AND NEW LETTERS OF THE BUCKLAND EDITION

INTRODUCTION BY JOHN BURROUGHS

ILLUSTRATIONS BY CLIFTON JOHNSON

NEW YORK
D. APPLETON & CO.
1895

Smithsonian Institution
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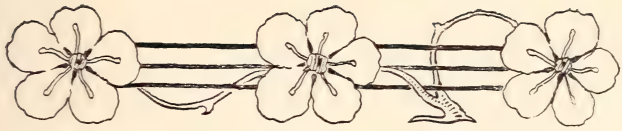


INTRODUCTION.

ONE of the few books which I can return to and re-read every six or seven years is this book of Gilbert White's. It has a perennial charm. It is much like country things themselves. One does not read it with excitement or eager avidity; it is in a low key; it touches only upon minor matters; it is not eloquent, or witty, or profound; it has only now and then a twinkle of humour or a glint of fancy, and yet it has lived an hundred years and promises to live many hundreds of years more. So many learned and elaborate treatises have sunk beneath the waves upon which this cockle-shell of a book rides so safely and buoyantly! What is the secret of its longevity? One can do little more than name its qualities without tracing them to their sources. It is simple and wholesome, like bread, or meat, or milk. Perhaps it is just this same unstrained quality that keeps the book alive. Books that are piquant and exciting like condiments, or cloying like confectionery or pastry, it seems, have a much less

chance of survival. The secret of longevity of a man—what is it? Sanity, moderation, regularity, and that plus vitality, which is a gift. The book that lives has these things, and it has that same plus vitality, the secret of which cannot be explored. The sensational, intemperate books set the world on fire for a day, and then end in ashes and forgetfulness.

White's book diffuses a sort of rural England atmosphere through the mind. It is not the work of a city man who went down into the country to write it up, but of a born countryman—one who had in the very texture of his mind the flavour of rural things. Then it is the growth of a particular locality. Let a man stick his staff into the ground anywhere and say "This is home," and describe things from that point of view, or as they stand related to that spot—the weather, the fauna, the flora—and his account shall have an interest to us it could not have if not thus located and defined. This is one secret of White's charm. His work has a home air, a certain privacy and particularity. The great world is afar off; Selborne is as snug and secluded as a chimney corner; we get an authentic glimpse into the real life of one man there; we see him going about intent, lovingly intent, upon every phase of nature about him. We get glimpses into humble cottages and into the ways and doings of the people; we see the bacon drying in the chimneys; we see

the poor gathering in Wolmer Forest the sticks and twigs dropped by the rooks in building their nests; we see them claiming the "lop and top" when the big trees are cut. Indeed, the human touches, the human figures here and there in White's pages add much to the interest. The glimpses we get of his own goings and comings—we wish there were more of them. We should like to know what took him to London during that great snow-storm of January, 1776, or how he got there, inasmuch as the roads were so blocked by the snow that the carriages from Bath with their fine ladies on their way to attend the Queen's birthday were unable to get through. "The ladies fretted, and offered large rewards to labourers if they would shovel them a track to London, but the relentless heaps of snow were too bulky to be removed." The parson found the city bedded deep in snow, and so noiseless by reason of it that "it seemed to convey an uncomfortable idea of desolation."

When one reads the writers of our own day upon rural England and the wild life there, he finds that they have not the charm of the Selborne naturalist; mainly, I think, because they go out with deliberate intent to write up nature. They choose their theme; the theme does not choose them. They love the birds and flowers for the literary effects they can produce out of them. It requires no great talent to go out in the fields or woods and describe in grace-

ful sentences what one sees there—birds, trees, flowers, clouds, streams, etc.; but to give the atmosphere of these things, to seize the significant and interesting

Interior of Selborne Church.

features and to put the reader into sympathetic communication with them, that is another matter.

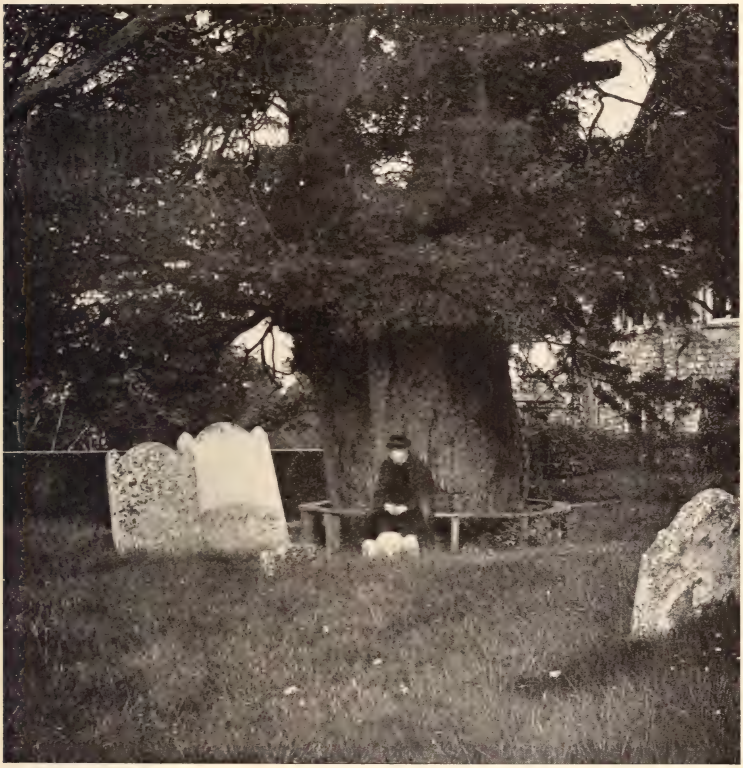
Hence back of all, the one thing that has told most in keeping White's book alive is undoubtedly its sound style—sentences actually filled with the living breath of a man. We are everywhere face to face with something genuine and real; objects, ideas, stand out on the page; the articulation is easy and distinct. The style of the born writer is like an open fire: we are in direct communication with his mind; we see the play of the forces at work; we get that precious sense of reality. All this is true of White's pages. Yet he had no literary ambitions. His style is that of a scholar, but of a scholar devoted to natural knowledge. There was evidently something winsome and charming about the man personally, and these qualities reappear in his pages.

White was a type of the true observer—the man with the detective eye. He did not seek to read his own thoughts and theories into Nature, but submitted his mind to her with absolute frankness and ingenuousness. He had infinite curiosity, and delighted in nothing so much as a new fact about the birds and the wild life around him. To see the thing as it was in itself and in its relations, that was his ambition. He could resist the tendency of his own mind to believe without sufficient evidence. Apparently he wanted to fall in with the notion current during the last century, that swallows hybernated in the

mud in the bottoms of streams and ponds, but he could not gather convincing proof. It was not enough that a few belated specimens were seen in the fall lingering about such localities, or again hovering over them early in spring; or that some old grandfather had seen a man who had taken live swallows out of the mud. Produce the man and let us cross-question him—that was White's attitude. Dr. Johnson said confidently that swallows did thus pass the winter in the mud "conglobulated into a ball," but Johnson had that literary cast of mind that prefers a picturesque statement to the exact fact. White was led astray by no literary ambition. His interest in the life of nature was truly a scientific one; he must know the fact first, and then give it to the humanities. How true it is in science, in literature, in life, that any secondary motives vitiate the result! Seek ye the kingdom of truth first and all things shall be added.

But White seems finally to have persuaded himself that at least a few swallows passed the winter in England in a torpid state—if not in the bottom of streams or ponds, then in holes in their banks. He reasoned from analogy, though he had expressed his distrust of the mode of reasoning. If bats, insects, toads, turtles, and other creatures can thus pass the winter, why not swallows? On many different occasions of a mild day late in the fall, and early in the spring, he saw house-martins flying about; on

the weather suddenly changing to colder, they quickly disappeared. Bats and turtles came forth and then vanished in the same way. White finally con-



Under the great yew in Selborne Churchyard.

cluded that the mystery was the same in both cases—that the creatures were brought from their winter retreats by the warmth, only to retire to them again when it changed to cold. If he had

adhered to his usual caution he would have waited for actual proof of this fact—the finding of a torpid swallow. He made frequent search for such, but never found any.

This notion so long current about the swallows probably had its origin in two things: first, their partiality for mud as nesting material; and secondly, the habit of these birds, after they have begun to collect into flocks in midsummer, preparatory to their migrations, of passing the night in vast numbers along the margins of streams and ponds. White knew of their habits in this respect, and wanted to see in the fact presumptive evidence of the truth of the notion that, though they may not retire into the water itself, yet that they "may conceal themselves in the banks of pools and rivers during the uncomfortable months of the year." One midsummer twilight in northern Vermont I came upon hundreds of swallows—barn and cliff—settled for the night upon some low alders that grew upon the margin of a deep still pool in the river. The bushes bent down with them as with an over-load of fruit. This attraction for the water on the part of the swallow family is certainly a curious one, and is not easily explained.

Our sharp-eyed parson had observed that the nesting habits of birds afford a clue to their roosting habits; that they usually pass the night in such places as they build their nests. Thus, the tree-build-

ers roost in trees; the ground-builders upon the ground. I have seen our chickadee and woodpecker enter, late in the day, the cavities in decaying limbs of trees. I have seen the oriole dispose of herself for the night on the end of a maple branch where her "pendent bed and procreant cradle" was begun a few days later. In walking through the summer fields in the twilight, the vesper sparrow or the song sparrow will often start up from almost beneath one's feet. It is said that the snow-bunting will plunge beneath the snow and pass the night there. The ruffed grouse often does this, but the swallows seem to be an exception to this rule. I have seen a vast cloud of swifts take up their lodging for the night in a tall, unused chimney; but the barn swallows and the cliff and white-bellied

Faringdon Church.

swallows, at least after the young have flown, appear to pass the night in the vicinity of streams. White noticed also—and here the true observer again crops out—that the fieldfare, a kind of thrush, though a tree-builder, yet always appears to pass the night on the ground. "The larkers, in dragging their nets by night, frequently catch them in the wheat stubbles." He learned, as every observer sooner or later learns, to be careful of sweeping statements—that the truth of nature is not always caught by the biggest generalisations. After speaking of the birds that dust themselves, earth their plumage—*pulveratrices*, as he calls them—he says: "As far as I can observe, many birds that dust themselves never wash, and I once thought that those birds that wash themselves would never dust; but here I find myself mistaken," and instances the house sparrow as doing both. White seems to have been about the first writer upon natural history who observed things minutely; he saw through all those sort of sleight-o'-hand movements and ways of the birds and beasts. He held his eye firmly to the point. He saw the swallows feed their young on the wing; he saw the fern-owl while hawking about a large oak "put out its short leg while on the wing, and by a bend of the head deliver something into its mouth." This explained to him the use of its middle toe, "which is curiously furnished with a serrated claw." He times the white owls feeding their

Selborne Church from the short lythe.

young under the eaves of his church, with watch in hand. He saw them transfer the mouse they brought from the foot to the beak, that they might have the free use of the former in ascending to the nest.

In his walks and drives about the country he was all attention to the life about him, simply from his delight in any fresh bit of natural knowledge. His curiosity never flagged. He had naturally an alert mind. His style reflects this alertness and sensitiveness. In his earlier days he was an enthusiastic sportsman, and he carried the sportsman's trained sense and love of the chase into his natural-history studies. He complained that faunists were too apt to content themselves with general terms and bare descriptions; the reason, he says, is plain—"because all that may be done at home in a man's study; but the investigation of the life and conversation of animals is a concern of much more trouble and difficulty, and is not to be attained but by the active and inquisitive, and by those that reside much in the country." He himself had the true inquisitiveness and activity, and the loving, discriminating eye. He saw the specific marks and differences at a glance. Then, his love of these things was so well known in the neighbourhood, that this kind of knowledge flowed to him from all sides. He was a magnet that attracted all the fresh, natural lore about him. People brought him birds and eggs and nests, and

A Faringdon byway.

animals or any natural curiosity, and reported to him any unusual occurrence. They loaned him the use of their eyes and ears. One day a countryman told

him he had found a young fern-owl in the nest of a small bird on the ground, and that it was fed by the little bird. "I went to see this extraordinary phenomenon, and found that it was a young cuckoo hatched in the nest of a titlark; it was become vastly too big for its nest, appearing to have its large wings extended beyond the nest,"

'. . . in tenui re
Majores pennaes nido, extendisse,'

and was very fierce and pugnacious, pursuing my finger, as I teased it, for many feet from the nest, and sparring and buffetting with its wings like a gamecock. The dupe of a dam appeared at a distance, hovering about with meat in its mouth, and expressing the greatest solicitude."

He observed that the train of the peacock was really not its tail, but an entirely separate appendage. He remarked how extremely fond cats are of fish, and yet of all quadrupeds "are the least disposed towards the water." This is a curious fact to him. A neighbour of his, in ploughing late in the fall, turned a water-rat out of his hybernaculum in a field far removed from any water. The rat had laid up above a gallon of potatoes for its winter food. This was another curious fact that set the writer speculating His correspondent tells him of a heronry near some manor-house that excites his curiosity much. "Fourscore nests of such a bird on one tree is a rarity

which I would ride half as many miles to get a sight of." Such a lively curiosity had the parson. His thirst for exact knowledge was so great, that on one occasion he took measurements of the carcass of a moose when he was probably compelled to hold his nose to finish the task. At one place he heard of a woman who professed to cure cancers by the use of toads; some of his brother clergymen believed the story, but when he came to sift the evidence he made up his mind that the woman was a fraud.

He said truly, "There is such a propensity in mankind towards deceiving and being deceived, that one cannot safely relate anything from common report, especially in print, without expressing some degree of doubt and suspicion."

The observations of hardly one man in five hundred are of any value for scientific purposes.

White had the true scientific caution, and was, as a rule, very careful to verify his statements.

Of course the science of White's time was far behind our own. The phenomenon of the weather, for instance, was not understood then as it is now. The great atmospheric waves that sweep across the continents and the regular alternations of heat and cold were unsuspected. White observes that cold descended from above, but he thought that thaws often originated under ground, "from warm vapours which arise." He was greatly puzzled, too, when, during

the severe cold of December, 1784, the thermometer fell many degrees lower in the valley bottoms than on the hills. He had not observed that the very cold air on such occasions settles down into the valleys and fills them like water, marking the height to which it rises by a level line upon the trees or foliage. It is a wonder that his sharp eye did not detect the true source of heavy dew, but it did not. He thought it proceeded from the effluvia of flowers, which, being drawn up into the sky by the warmth of the sun by day, descended again as dew by night.

When a French anatomist announced that he had discovered why the cuckoo did not hatch its own eggs—namely, because the crop or craw of the bird was placed back of the sternum, so as to make a protuberance on the belly—White dissected a cuckoo for himself, and, finding the fact as stated, proceeded to dissect other birds that he knew did incubate, as the fern-owl and a hawk; and finding the craw situated the same as in the cuckoo, justly charged the Frenchman with having reached an unscientific conclusion.

In his seventy-seventh letter White clearly anticipates Darwin as to the beneficial functions of earthworms in the soil, and tells farmers and gardeners that the little creatures which they look upon as their enemy is really their best friend.

Changes are slow in England. All the essential features of Selborne remain about as they were in

White's time. It is still a humble rural village. His church, his house, the Hanger, Wolmer Forest, the old yew, all remain. I spent two days there in June, 1882. The pictures of Mr. Johnson that illustrate this edition, taken as they were from the actual scenes, bring back the memory of my visit very vividly. The stone that marks White's grave has only his initials upon it. I could not see any signs of its being visited any oftener than the unknown graves. At the inn a copy of his book was not to be had. In a meadow near the church the haymakers, mostly women, were at work. A mother set her baby down amid the hay, where it cried long and lustily while she continued unconcerned with her rake. I walked amid the noble but dripping beeches of the Hanger and along green lanes and across fields in other directions. I saw and heard the black-cap

White's grave.

warbler, but took little note of other birds. I was more especially in quest of the nightingale, but failed to find her.

Rural England has charms of which we get but faint glimpses in this country, and I found Selborne deeply interesting in itself, as well as for its associations with the famous nature-loving parson.

JOHN BURROUGHS.

April, 1895.

A stile in the long lythe.

Selborne from the Hanger.

THE
NATURAL HISTORY OF SELBORNE.

LETTER I.

To Thomas Pennant, Esq.

The parish of Selborne lies in the extreme eastern corner of the county of Hampshire, bordering on the county of Sussex, and not far from the county of Surrey; it is about fifty miles south-west of London, in latitude 51°, and near midway between the towns of Alton and Petersfield. Being very large and extensive, it abuts on twelve parishes, two of which are in Sussex, viz., Trotton and Rogate. If you begin from the south and proceed westward the adjacent parishes are Emshot, Newton Valence, Faringdon, Harteley-Mauduit, Great Wardleham, Kingsley, Hedleigh, Bramshot, Trotton, Rogate, Lysse, and Greatham. The soils of this district are almost as various and diversified as the views and aspects. The high part to the south-west consists of a vast hill of chalk, rising three hundred feet above the village, and is divided into a sheep down, the high wood, and a long hanging wood called the Hanger.

The covert of this eminence is altogether beech, the most lovely of all forest trees, whether we consider its smooth rind or bark, its glossy foliage, or graceful pendulous boughs. The down, or sheep-walk, is a pleasant park-like spot, of about one mile by half that space, jutting out on the verge of the hill-country, where it begins to break down into the plains, and commanding a very engaging view, being an assemblage of hill, dale, woodlands, heath, and water.

A bit of Selborne village.

The prospect is bounded to the south-east and east by the vast range of mountains called the Sussex downs, by Guilddown near Guildford, and by the downs round Dorking, and Ryegate in Surrey, to

the north-east, which altogether, with the country beyond Alton and Farnham, form a noble and extensive outline.

At the foot of this hill, one stage or step from the uplands, lies the village, which consists of one single straggling street, three-quarters of a mile in length, in a sheltered vale, and running parallel with the Hanger. The houses are divided from the hill by a vein of stiff clay (good wheat land), yet stand on a rock of white stone, little in appearance removed from chalk; but seems so far from being calcareous, that it endures extreme heat. Yet that the freestone still preserves somewhat that is analogous to chalk, is plain from the beeches which descend as low as those rocks extend, and no farther, and thrive as well on them, where the ground is steep, as on the chalks.

The cart-way of the village divides, in a remarkable manner, two very incongruous soils. To the south-west is a rank clay, that requires the labour of years to render it mellow; while the gardens to the north-east, and small inclosures behind, consist of a warm, forward, crumbling mould, called black malm, which seems highly saturated with vegetable and animal manure; and these may perhaps have been the original site of the town; while the woods and coverts might extend down to the opposite bank.

At each end of the village, which runs from south-east to north-west, arises a small rivulet: that

at the north-west end frequently fails; but the other is a fine perennial spring, called Well-head, little influenced by drought or wet seasons, inasmuch as it produced on the 14th September, 1781, after a severe hot summer and a preceding dry spring and winter, nine gallons of water in a minute, at a time when many of the wells failed, and all the ponds in the vales were dry.

This spring breaks out of some high grounds joining to Nore Hill, a noble chalk promontory, remarkable for sending forth two streams into two different seas. The one to the south becomes a branch of the Arun, running to Arundel, and so falling into the British Channel: the other to the north. The Selborne stream makes one branch of the Wey; and, meeting the Blackdown stream at Hedleigh, and the Alton and Farnham stream at Tilford Bridge, swells into a considerable river, navigable at Godalming; from whence it passes to Guildford, and so into the Thames at Weybridge; and thus at the Nore into the German Ocean.

Our wells, at an average, run to about sixty-three feet, and when sunk to that depth seldom fail; but produce a fine limpid water, soft to the taste, and much commended by those who drink the pure element, but which does not lather well with soap.

To the north-west, north, and east of the village is a range of fair inclosures, consisting of what is called a white malm, a sort of rotten or rubble stone,

which, when turned up to the frost and rain, moulders to pieces and becomes manure to itself.

Still on to the north-east, and a step lower, is a kind of white land, neither chalk nor clay, neither fit for pasture nor for the plough, yet kindly for hops, which root deep into the freestone, and have their poles and wood for charcoal growing just at hand. This white soil produces the brightest hops.

As the parish still inclines down towards Wolmer Forest, at the juncture of the clays and sand, the soil becomes a wet, sandy loam, remarkable for its timber and infamous for roads. The oaks of Temple and Blackmoor stand high in the estimation of purveyors, and have furnished much naval timber; while the trees on the freestone grow large, but are what workmen call shaky, and so brittle as often to fall to pieces in sawing. Beyond the sandy loam the soil becomes a hungry lean sand, till it mingles with the forest; and will produce little without the assistance of lime and turnips.

LETTER II.

To Thomas Pennant, Esq.

In the court of Norton farmhouse, a manor-farm to the north-west of the village, on the white malm, stood within these twenty years a broad-leaved elm,

or wych hazel, *Ulmus folio latissimo scabro*, of Ray, which, though it had lost a considerable leading bough, equal to a moderate tree, in the great storm in the year 1703, yet, when felled, contained eight loads of timber; and being too bulky for carriage, was sawn off at seven feet above the butt, where it measured near eight feet in the diameter. This elm I mention to show to what a bulk planted elms may attain; as this tree must certainly have been such from its situation.

In the centre of the village, and near the church, is a square piece of ground surrounded by houses,

The Plestor.

and vulgarly called the Plestor. In the midst of this spot stood, in old times, a vast oak, with a short

squat body and huge horizontal arms, extending almost to the extremity of the area. This venerable tree, surrounded with stone steps, and seats above them, was the delight of old and young, and a place of much resort in summer evenings; where the former sat in grave debate, while the latter frolicked and danced before them. Long might it have stood, had not the amazing tempest in 1703 overturned it at once, to the infinite regret of the inhabitants and the vicar, who bestowed several pounds in setting it in its place again: but all his care could not avail; the tree sprouted for a time, then withered and died. This oak I mention to show to what a bulk planted oaks also may arrive: and planted this tree must certainly have been, as appears from what is known concerning the antiquities of the village.

On the Blackmoor estate there is a small wood called Losel's, of a few acres, that was lately furnished with a set of oaks of a peculiar growth and great value; they were tall and taper like firs, but standing near together had very small heads, only a little brush without any large limbs. About twenty years ago, the bridge at the Toy, near Hampton Court, being much decayed, some trees were wanted for the repairs that were fifty feet long without bough, and would measure twelve inches diameter at the little end. Twenty such trees did a purveyor find in this little wood, with this advantage, that many of them answered the description

at sixty feet. These trees were sold at twenty pounds apiece.

In the centre of this grove there stood an oak, which, though shapely and tall on the whole, bulged out into a large excrescence about the middle of the stem. On this a pair of ravens had fixed their residence for such a series of years, that the oak was distinguished by the title of the Raven Tree. Many were the attempts of the neighbouring youths to get at this eyry : the difficulty whetted their inclinations, and each was ambitious of surmounting the arduous task. But when they arrived at the swelling, it jutted out so in their way, and was so far beyond their grasp, that the most daring lads were awed, and acknowledged the undertaking to be too hazardous. So the ravens built on, nest upon nest, in perfect security, till the fatal day arrived in which the wood was to be levelled. It was in the month of February, when those birds usually sit. The saw was applied to the butt, the wedges were inserted into the opening, the woods echoed to the heavy blows of the beetle or mallet, the tree nodded to its fall ; but still the dam sat on. At last, when it gave way, the bird was flung from her nest ; and, though her parental affection deserved a better fate, was whipped down by the twigs, which brought her dead to the ground.

LETTER III.

To Thomas Pennant, Esq.

The fossil-shells of this district, and sorts of stone, such as have fallen within my observation, must not be passed over in silence. And first I must mention, as a great curiosity, a specimen that was ploughed up in the chalky fields, near the side of the down, and given to me for the singularity of its appearance; which, to an incurious eye, seems like a petrified fish of about four inches long, the *cardo* (hinge) passing for a head and mouth. It is in reality a bivalve of the Linnæan genus of *Mytilus*, and the species of *Crista Galli;* called by Lister, *Rastellum;* by Rumphius, *Ostreum plicatum minus;* by D'Argenville, *Auris porci*, s. *Crista Galli;* and by those who make collections, cock's comb. Though I applied to several such in London, I never could meet with an entire specimen; nor could I ever find in books any engraving from a perfect one. In the superb museum at Leicester House, permission was given me to examine for this article; and though I was disappointed as to the fossil, I was highly gratified with the sight of several of the shells themselves in high preservation. This bivalve is only known to inhabit the Indian Ocean, where it fixes itself to a zoophyte known by the name *Gorgonia*. The curious foldings of the suture, the one into the other, the alternate

flutings or grooves, and the curved form of my specimen are much easier expressed by the pencil than by words.

Cornua Ammonis are very common about this village. As we were cutting an inclining path up the Hanger, the labourers found them frequently on that steep, just under the soil, in the chalk, and of a con-

An old chalk pit.

siderable size. In the lane above Well-head, in the way to Emshot, they abound in the bank, in a darkish sort of marl, and are usually very small and soft: but in Clay's Pond, a little farther on, at the end of the pit, where the soil is dug out for manure, I have occasionally observed them of large dimensions, perhaps fourteen or sixteen inches in diameter. But as these did not consist of firm stone, but were formed

of a kind of *terra lapidosa*, or hardened clay, as soon as they were exposed to the rains and frost they mouldered away. These seemed as if they were of very recent production. In the chalk-pit, at the north-west end of the Hanger, large *nautili* are sometimes observed.

In the very thickest strata of our freestone, and at considerable depths, well-diggers often find large scallops or *pectines*, having both shells deeply striated, and ridged and furrowed alternately. They are highly impregnated with, if not wholly composed of, the stone of the quarry.

LETTER IV.

To Thomas Pennant, Esq.

As in a former letter the freestone of this place has been only mentioned incidentally, I shall here become more particular. This stone is in great request for hearthstones and the beds of ovens; and in lining of lime-kilns it turns to good account; for the workmen use sandy loam instead of mortar; the sand of which fluxes, and runs by the intense heat, and so cases over the whole face of the kiln with a strong vitrified coat like glass, that it is well preserved from injuries of weather, and endures thirty or forty years. When chiselled smooth, it makes elegant fronts for

houses, equal in colour and grain to the Bath stone; and superior in one respect, that, when seasoned, it does not scale. Decent chimney-pieces are worked from it of much closer and finer grain than Portland; and rooms are floored with it; but it proves rather too soft for this purpose. It is a freestone, cutting in all directions; yet has something of a grain parallel with the horizon, and therefore should not be *sur-bedded*—that is, set edgewise, contrary to its position in the quarry—but laid in the same position that it occupies there. On the ground abroad this fire-stone will not succeed for pavements, because, probably, some degree of saltness prevailing within it, the rain tears the slabs to pieces.* Though this stone is too hard to be acted on by vinegar, yet both the white part and even the blue rag ferment strongly in mineral acids. Though the white stone will not bear wet, yet in every quarry at intervals there are thin strata of blue rag, which resist rain and frost, and are excellent for pitching of stables, paths, and courts, and for building of dry walls against banks; a valuable species of fencing, much in use in this village; and for mending of roads. This rag is rugged and stubborn, and will not hew to a smooth face; but is very durable: yet, as these strata are shallow and lie deep, large quantities cannot be procured but at con-

* "Fire-stone is full of salts, and has no sulphur: it must be close grained, and have no interstices. Nothing supports fire like salts; salt-stone perishes when exposed to wet and frost."—PLOT's *Staff.* p. 152.

siderable expense. Among the blue rags turn up some blocks tinged with a stain of yellow or rust colour, which seem to be nearly as lasting as the blue; and every now and then balls of a friable substance, like rust of iron, called rust balls.

In Wolmer Forest, I see but one sort of stone, called by the workmen sand or forest-stone. This is generally of the colour of rusty iron, and might probably be worked as iron ore; is very hard and heavy, and of a firm, compact texture, and composed of a small roundish crystalline grit, cemented together by a brown, terrene, ferruginous matter; will not cut without difficulty, nor easily strike fire with steel. Being often found in broad flat pieces, it makes good pavement for paths about houses, never becoming slippery in frost or rain; is excellent for dry walls, and is sometimes used in buildings. In many parts of that waste it lies scattered on the surface of the ground, but is dug on Weaver's Down, a vast hill on the eastern verge of that forest, where the pits are shallow and the stratum thin. This stone is imperishable.

From a notion of rendering their work the more elegant, and giving it a finish, masons chip this stone into small fragments about the size of the head of a large nail, and then stick the pieces into the wet mortar along the joints of their freestone walls: this embellishment carries an odd appearance, and has

occasioned strangers sometimes to ask us pleasantly "whether we fastened our walls together with ten-penny nails."

LETTER V.

To Thomas Pennant, Esq.

Among the singularities of this place the two rocky hollow lanes, the one to Alton, and the other to the forest, deserve our attention. These roads, running through the malm lands, are, by the traffic of ages, and the fretting of water, worn down through the first stratum of our freestone, and partly through the second; so that they look more like water-courses than roads; and are bedded with naked rag for furlongs together. In many places they are reduced sixteen or eighteen feet beneath the level of the fields; and after floods, and in frosts, exhibit very grotesque and wild appearances, from the tangled roots that are twisted among the strata, and from the torrents rushing down their broken sides; and especially when those cascades are frozen into icicles, hanging in all the fanciful shapes of frost-work. These rugged, gloomy scenes affright the ladies when they peep down into them from the paths above, and make timid horsemen shudder while they ride along them; but delight the naturalist with their various botany, and particu-

larly with the curious *filices* with which they abound.

The manor of Selborne, were it strictly looked after, with all its kindly aspects, and all its sloping coverts, would swarm with game; even now hares, partridges, and pheasants abound; and in old days woodcocks were as plentiful. There are few quails, because they more affect open fields than inclosures; after harvest some few landrails are seen.

The parish of Selborne, by taking in so much of the forest, is a vast district. Those who tread the bounds are employed part of three days in the business, and are of opinion that the outline, in all its curves and indentings, does not comprise less than thirty miles.

The village stands in a sheltered spot, secured by the Hanger from the strong westerly winds. The air is soft, but rather moist from the effluvia of so many trees; yet perfectly healthy and free from agues.

The quantity of rain that falls on it is very considerable, as may be supposed in so woody and mountainous a district. As my experience in measuring the water is but of short date, I am not qualified to give the mean quantity, but a very intelligent gentleman assures me (and he speaks from upwards of forty years' experience) that the mean rain of any place cannot be ascertained till a person has measured it for a very long period. I only know that

	Inch.	*Hund.*
From May 1, 1779, to the end of the year there fell .	28	37 !
From Jan. 1, 1780, to Jan. 1, 1781	27	32
From Jan. 1, 1781, to Jan. 1, 1782	30	71
From Jan. 1, 1782, to Jan. 1, 1783	50	26 !
From Jan. 1, 1783, to Jan. 1, 1784	33	71
From Jan. 1, 1784, to Jan. 1, 1785	38	80
From Jan. 1, 1785, to Jan. 1, 1786	31	55
From Jan. 1, 1786, to Jan. 1, 1787	39	57

The village of Selborne, and the large hamlet of Oakhanger, with the single farms, and many scattered houses along the verge of the forest, contain upwards of six hundred and seventy inhabitants.

We abound with poor; many of whom are sober and industrious, and live comfortably in good stone or brick cottages, which are glazed, and have chambers above stairs: mud buildings we have none. Besides the employment from husbandry, the men work in hop-gardens, of which we have many; and fell and bark timber. In the spring and summer the women weed the corn; and enjoy a second harvest in September by hop-picking. Formerly, in the dead months they availed themselves greatly by spinning wool, for making of barragons, a genteel corded stuff, much in vogue at that time for summer wear; and chiefly manufactured at Alton, a neighbouring town, by some of the people called Quakers. The inhabitants enjoy a good share of health and longevity, and the parish swarms with children.

LETTER VI.

To Thomas Pennant, Esq.

Should I omit to describe with some exactness the Forest of Wolmer, of which three-fifths perhaps lie in this parish, my account of Selborne would be very imperfect, as it is a district abounding with many curious productions, both animal and vegetable, and has often afforded me much entertainment both as a sportsman and as a naturalist.

The royal Forest of Wolmer is a tract of land of about seven miles in length by two-and-a-half in breadth, running nearly from north to south, and is abutted on—to begin to the south, and so to proceed eastward—by the parishes of Greatham, Lysse, Rogate, and Trotton, in the county of Sussex; by Bramshot, Hedleigh, and Kingsley. This royalty consists entirely of sand, covered with heath and fern; but is somewhat diversified with hills and dales, without having one standing tree in the whole extent. In the bottoms, where the waters stagnate, are many bogs, which formerly abounded with subterraneous trees; though Dr. Plot says positively * that "there never were any fallen trees hidden in the mosses of the southern counties." But he was mistaken: for I myself have seen cottages on the verge

* See his History of Staffordshire.

of this wild district whose timbers consisted of a black hard wood, looking like oak, which the owners assured me they procured from the bogs by probing the soil with spits, or some such instruments: but the peat is so much cut out, and the moors have been so well examined, that none has been found of late. Old people, however, have assured me that on a winter's morning they have discovered these trees in the bogs by the hoar frost, which lay longer over the space where they were concealed than on the surrounding morass. Nor does this seem to be a fanciful notion, but consistent with true philosophy. Besides the oak, I have also been shown pieces of fossil wood, of a paler colour and softer nature, which the inhabitants called fir: but, upon a nice examination, and trial by fire, I could discover nothing resinous in them; and therefore rather suppose that they were parts of a willow or alder, or some such aquatic tree.

This lonely domain is a very agreeable haunt for many sorts of wild fowls, which not only frequent it in the winter, but breed there in the summer; such as lapwings, snipes, wild ducks, and, as I have discovered within these few years, teals. Partridges in vast plenty are bred in good seasons on the verge of this forest, into which they love to make excursions: and in particular in the dry summer of 1740 and 1741, and some years after, they swarmed to such a degree that parties of unreasonable sports-

Wolmer forest.

men killed twenty and sometimes thirty brace in a day.

But there was a nobler species of game in this forest, now extinct, which I have heard old people say abounded much before shooting flying became so common, and that was the heath-cock, or black game. When I was a little boy I recollect one coming now and then to my father's table. The last pack remembered was killed about thirty-five years ago; and within these ten years one solitary grey hen was sprung by some beagles in beating for a hare. The sportsman cried out, "A hen pheasant!" but a gentleman present, who had often seen black game in the north of England, assured me that it was a grey hen.

Nor does the loss of our black game prove the only gap in the *Fauna Selborniensis;* for another beautiful link in the chain of beings is wanting: I mean the red-deer, which towards the beginning of this century amounted to about five hundred head, and made a stately appearance. There is an old keeper, now alive, named Adams, whose great-grandfather (mentioned in a perambulation taken in 1635), grandfather, father and self, enjoyed the head keepership of Wolmer Forest in succession for more than a hundred years. This person assures me, that his father has often told him, that Queen Anne, as she was journeying on the Portsmouth road, did not think the forest of Wolmer beneath her royal regard.

For she came out of the great road at Lippock, which is just by, and, reposing herself on a bank smoothed for that purpose, lying about half a mile to the east of Wolmer Pond, and still called Queen's Bank, saw with great complacency and satisfaction the whole herd of red-deer brought by the keepers along the vale before her, consisting then of about five hundred head. A sight this worthy the attention of the greatest sovereign! But he farther adds that, by means of the Waltham blacks, or, to use his own expression, as soon as they began blacking, they were reduced to about fifty head, and so continued decreasing till the time of the late Duke of Cumberland. About the year 1737, his highness sent down a huntsman, and six yeomen-prickers, in scarlet jackets laced with gold, attended by the stag-hounds; ordering them to take every deer in this forest alive, and to convey them in carts to Windsor. In the course of the summer they caught every stag, some of which showed extraordinary diversion: but, in the following winter, when the hinds were also carried off, such fine chases were exhibited as served the country people for matter of talk and wonder for years afterwards. I saw myself one of the yeomen-prickers single out a stag from the herd, and must confess it was the most curious feat of activity I ever beheld. The exertions made by the horse and deer much exceeded all my expectations; though the former greatly excelled the latter in speed. When

the devoted deer was separated from his companions, they gave him, by their watches, law, as they called it, for twenty minutes; when, sounding their horns, the stop-dogs were permitted to pursue, and a most gallant scene ensued.

LETTER VII.

To Thomas Pennant, Esq.

Though large herds of deer do much harm to the neighbourhood, yet the injury to the morals of the people is of more moment than the loss of their crops. The temptation is irresistible; for most men are sportsmen by constitution: and there is such an inherent spirit for hunting in human nature, as scarce any inhibitions can restrain. Hence, towards the beginning of this century, all this country was wild about deer-stealing. Unless he was a hunter, as they affected to call themselves, no young person was allowed to be possessed of manhood or gallantry. The Waltham blacks at length committed such enormities, that Government was forced to interfere with that severe and sanguinary Act called the Black Act (9 Geo. I. c. 22), which comprehends more felonies than any law that ever was framed before. And therefore, Dr. Hoadley, the Bishop of Winchester, when urged to re-stock Waltham-chase, refused, from

a motive worthy of a prelate, replying that "it had done mischief enough already."

Our old race of deer-stealers are hardly extinct yet: it was but a little while ago that they used to recount, over their ale, the exploits of their youth; such as watching the pregnant hind to her lair, and, when the calf was dropped, paring its feet with a penknife to the quick to prevent its escape, till it was large and fat enough to be killed; the shooting at one of their neighbours with a bullet in a turnip-field by moonshine, mistaking him for a deer; and the losing a dog in the following extraordinary manner:—Some fellows, suspecting that a calf new-fallen was deposited in a certain spot of thick fern, went, with a lurcher, to surprise it; when the parent hind rushed out of the brake, and, taking a vast spring with all her feet close together, pitched upon the neck of the dog, and broke it short in two.

Another temptation to idleness and sporting was a number of rabbits, which possessed all the hillocks and dry places; but these being inconvenient to the huntsmen, on account of their burrows, when they came to take away the deer they permitted the country people to destroy them all.

Such forests and wastes, when their allurements to irregularities are removed, are of considerable service to neighbourhoods that verge upon them, by furnishing them with peat and turf for their firing; with fuel for the burning their lime; and with ashes

for their grasses; and by maintaining their geese and their stock of young cattle at little or no expense.

The manor-farm of the parish of Greatham has an admitted claim, I see (by an old record taken from the Tower of London), of turning all live stock on the forest, at proper seasons, *bidentibus exceptis*. For this privilege the owner of that estate used to pay to the king annually seven bushels of oats. In the Holt Forest, where a full stock of fallow-deer has been kept up till lately, no sheep are admitted. The reason, I presume, being that sheep are such close grazers, they would pick out all the finest grasses, and hinder the deer from thriving.

Though (by statute 4 and 5 Wm. and Mary, c. 23) "to burn on any waste, between Candlemas and Midsummer, any grig, ling, heath, and furze gorse or fern, is punishable with whipping and confinement in the House of Correction;" yet, in this forest, about March or April, according to the dryness of the season, such vast heath-fires are lighted up, that they often get to a masterless head, and, catching the hedges, have sometimes been communicated to the underwoods, woods, and coppices, where great damage has ensued. The plea for these burnings is, that when the old coat of heath, &c., is consumed, young will sprout up and afford much tender browse for cattle; but, where there is large old furze, the fire, following the roots, consumes the very ground; so that for hundreds of acres nothing

is to be seen but smother and desolation, the whole circuit round looking like the cinders of a volcano; and the soil being quite exhausted, no traces of vegetation are to be found for years. These conflagrations, as they take place usually with a north-east or east wind, much annoy this village with their smoke, and often alarm the country; and, once in particular, I remember that a gentleman, who lives beyond Andover, coming to my house, when he got on the downs between that town and Winchester, at twenty-five miles distance was surprised much with smoke and a hot smell of fire; and concluded that Alresford was in flames; but when he came to that town, he then had apprehensions for the next village, and so on to the end of his journey.*

On two of the most conspicuous eminences of this forest stand two arbours or bowers made of the boughs of oaks; the one called Waldon Lodge, the other Brimstone Lodge: these the keepers renew

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* This description reminds the scholar of the stubble-burning described in Virgil's "Georgics," i. 84, Mitford. There is no better fertilizer for the soil than the ashes of weeds and other vegetable growths, and this the poet knew.

> "Sæpe etiam steriles incendere profuit agros,
> Atque levem stipulam crepitantibus urere flammis:
> Sive inde occultas vires et pabula terræ
> Pinguia concipiunt."

> "Long practice has a sure improvement found,
> With kindled fires to burn the barren ground;
> When the light stubble, to the flames resigned,
> Is driven along, and crackles to the wind."—DRYDEN.

annually on the feast of St. Barnabas, taking the old materials for a perquisite. The farm called Blackmoor, in this parish, is obliged to find the posts and brushwood for the former; while the farms at Greatham, in rotation, furnish for the latter; and are all enjoined to cut and deliver the materials at the spot. This custom I mention, because I look upon it to be of very remote antiquity.

LETTER VIII.

To Thomas Pennant, Esq.

On the verge of the forest, as it is now circumscribed, are three considerable lakes, two in Oakhanger, of which I have nothing particular to say; and one called Bin's, or Bean's Pond, which is worthy the attention of a naturalist or a sportsman. For, being crowded at the upper end with willows, and with the *Carex cespitosa;* the sort which, rising into tall hassocks, is called by the foresters, torrets; a corruption, I suppose, of turrets; it affords such a safe and pleasing shelter to wild ducks, teals, and snipes, that they breed there. In the winter this covert is also frequented by foxes, and sometimes by pheasants; and the bogs produce many curious plants.

By a perambulation of Wolmer Forest and the

Holt, made in 1635, and in the eleventh year of Charles the First (which now lies before me), it appears that the limits of the former are much circumscribed. For, to say nothing of the farther side, with which I am not so well acquainted, the bounds on this side, in old times, came into Binswood; and extended to the ditch of Wardleham Park, in which stands the curious mount called King John's Hill, and Lodge Hill; and to the verge of Hartley Mauduit, called Mauduit Hatch; comprehending also Shortheath, Oakhanger, and Oakwoods; a large district, now private property, though once belonging to the royal domain.

It is remarkable that the term purlieu is never once mentioned in this long roll of parchment. It contains, besides the perambulation, a rough estimate of the value of the timbers, which were considerable, growing at that time in the district of the Holt; and enumerates the officers, superior and inferior, of those joint forests, for the time being, and their ostensible fees and perquisites. In those days, as at present, there were hardly any trees in Wolmer Forest.

Within the present limits of the forest are three considerable lakes, Hogmer, Cranmer, and Wolmer; all of which are stocked with carp, tench, eels, and perch; but the fish do not thrive well, because the water is hungry, and the bottoms are a naked sand.

A circumstance respecting these ponds, though

by no means peculiar to them, I cannot pass over in silence; and that is, that instinct by which in sum-

Wolmer pond.

mer all the kine, whether oxen, cows, calves, or heifers, retire constantly to the water during the hotter hours; where, being more exempt from flies, and inhaling the coolness of that element, some belly deep, and some only to mid-leg, they ruminate and solace themselves from about ten in the morning till four in the afternoon, and then return to their feeding. During this great proportion of the day they drop much dung, in which insects nestle; and so supply food for the fish, which would be poorly subsisted but from this contingency. Thus nature, who is a great economist, converts the recreation of one

animal to the support of another! Thomson, who was a nice observer of natural occurrences, did not let this pleasing circumstance escape him. He says, in his "Summer,"

> "A various group the herds and flocks compose:
> ——————— on the grassy bank
> Some ruminating lay; while others stand
> Half in the flood, and, often bending, sip
> The circling surface."

Wolmer Pond, so called, I suppose, for eminence sake, is a vast lake for this part of the world, containing, in its whole circumference, 2,646 yards, or very near a mile and a half. The length of the north-west and opposite side is about 704 yards, and the breadth of the south-west end about 456 yards. This measurement, which I caused to be made with good exactness, gives an area of about sixty-six acres, exclusive of a large irregular arm at the north-east corner, which we did not take into the reckoning.

On the face of this expanse of waters, and perfectly secure from fowlers, lie all day long, in the winter season, vast flocks of ducks, teals, and widgeons, of various denominations; where they preen and solace and rest themselves, till towards sunset, when they issue forth in little parties (for in their natural state they are all birds of the night) to feed in the brooks and meadows; returning again with the dawn of the morning. Had this lake an arm or two

more, and were it planted round with thick covert (for now it is perfectly naked), it might make a valuable decoy.

Yet neither its extent, nor the clearness of its water, nor the resort of various and curious fowls, nor its picturesque groups of cattle, can render this meer so remarkable as the great quantity of coins that were found in its bed about forty years ago.*

LETTER IX.

To Thomas Pennant, Esq.

By way of supplement, I shall trouble you once more on this subject, to inform you that Wolmer, with her sister forest Ayles Holt, *alias* Alice Holt,†

* The circumstances under which these coins were discovered are thus related in the author's "Antiquities of Selborne:"—"In the very dry summers of 1740 and 41, the bed of this lake became as dry and dusty as the surrounding heath; and some of the forest cottagers, remembering stories of coins found by their fathers and grandfathers, began to search also, and with great success; they found great heaps of coin, one lying on the other, as shot there out of a bag, many of them in good preservation. They consisted solely of Roman copper coin in hundreds, and some medals of the Lower Empire. The neighbouring gentry and clergy chose what they liked, and some dozens fell to the author, chiefly of Marcus Aurelius and the Empress Faustina. Those of Faustina were in high relief, exhibiting agreeable features, and the medals of a paler colour than the coins."

† "In Rot. Inquisit. de statu forest. in Scaccar. 36 Ed. 3, it is called Aisholt." In "Tit. Wolmer and Aisholt Hantisc," we are told "the Lord King had one chapel in his park at Kingesle." "*Dominus Rex*

as it is called in old records, is held by grant from the Crown for a term of years.

The grantees that the author remembers are Brigadier-General Emanuel Scroope Howe, and his lady, Ruperta, who was a natural daughter of Prince Rupert by Margaret Hughs; a Mr. Mordaunt, of the Peterborough family, who married a dowager Lady Pembroke; Henry Bilson Legge and lady; and now Lord Stawel, their son.

The lady of General Howe lived to an advanced age, long surviving her husband; and, at her death, left behind her many curious pieces of mechanism of her father's constructing, who was a distinguished mechanic and artist, as well as warrior; and, among the rest, a very complicated clock, lately in possession of Mr. Elmer, the celebrated game-painter at Farnham, in the county of Surrey.

Though these two forests are only parted by a narrow range of inclosures, yet no two soils can be more different: for the Holt consists of a strong loam, of a miry nature, carrying a good turf, and abounding with oaks that grow to be large timber; while Wolmer is nothing but a hungry, sandy, barren waste.

The former, being all in the parish of Binsted, is about two miles in extent from north to south, and

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habet unam capellam in haiâ suâ de Kingesle.." "*Haia, sepes, sepimentum, parcus;* a Gall. *haie* and *haye.*"—SPELMAN'S *Glossary*, p. 272.

nearly as much from east to west; and contains within it many woodlands and lawns, and the great lodge where the grantees reside; and a smaller lodge called Goose-green; and is abutted on by the parishes of Kingsley, Frinsham, Farnham, and Bentley; all of which have right of common.

One thing is remarkable, that though the Holt has been of old well stocked with fallow-deer, unrestrained by any pales or fences more than a common hedge, yet they were never seen within the limits of Wolmer; nor were the red-deer of Wolmer ever known to haunt the thickets or glades of the Holt.

At present the deer of the Holt are much thinned and reduced by the night-hunters, who perpetually harass them in spite of the efforts of numerous keepers, and the severe penalties that have been put in force against them as often as they have been detected and rendered liable to the lash of the law. Neither fines nor imprisonments can deter them; so impossible is it to extinguish the spirit of sporting, which seems to be inherent in human nature.

General Howe turned out some German wild boars and sows in his forests, to the great terror of the neighbourbood; and, at one time, a wild bull or buffalo: but the country rose upon them and destroyed them.*

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* German boars and sows were also turned out in the New Forest by Charles the First, which bred and increased: and their stock is supposed to exist still.—MITFORD.

A very large fall of timber, consisting of about one thousand oaks, has been cut this spring (viz., 1784) in the Holt forest; one-fifth of which, it is said, belongs to the grantee, Lord Stawel. He lays claim also to the lop and top; but the poor of the parishes of Binsted and Frinsham, Bentley and Kingsley, assert that it belongs to them; and assembling in a riotous manner, have actually taken it all away. One man, who keeps a team, has carried home, for his share, forty stacks of wood. Forty-five of these people his lordship has served with actions. These trees, which were very sound and in high perfection, were winter-cut, viz., in February and March, before the bark would run. In old times, the Holt was estimated to be eighteen miles, computed measure, from water carriage, viz., from the town of Chertsey, on the Thames; but now it is not half that distance, since the Wey is made navigable up to the town of Godalming, in the county of Surrey.

LETTER X.

To Thomas Pennant, Esq.

It has been my misfortune never to have had any neighbour whose studies have led him towards the pursuit of natural knowledge; so that, for want of a companion to quicken my industry and sharpen my

attention, I have made but slender progress in a kind of information to which I have been attached from my childhood.

As to swallows (*Hirundines rusticæ*) being found in a torpid state during the winter in the Isle of

One of the old Selborne houses.

Wight, or any part of this country, I never heard any such account worth attending to. But a clergyman, of an inquisitive turn, assures me that, when he was a great boy, some workmen, in pulling down the battlements of a church tower early in the spring, found two or three swifts (*Hirundines apodes*) among the rubbish, which seemed, at their first appearance, dead; but, on being carried towards the

fire, revived. He told me that, out of his great care to preserve them, he put them in a paper bag, and hung them by the kitchen fire, where they were suffocated.

Another intelligent person has informed me that, while he was a schoolboy at Brighthelmstone, in Sussex, a great fragment of the chalk cliff fell down one stormy winter on the beach, and that many people found swallows among the rubbish; but, on my questioning him whether he saw any of those birds himself, to my no small disappointment he answered me in the negative, but that others assured him they did.

Young broods of swallows began to appear this year on July the eleventh, and young martins (*Hirundines urbicæ*) were then fledged in their nests. Both species will breed again once; for I see by my *fauna* of last year, that young broods came forth so late as September the eighteenth. Are not these late hatchings more in favour of hiding than migration? Nay, some young martins remained in their nests last year so late as September the twenty-ninth; and yet they totally disappeared with us by the fifth of October. How strange it is that the swift, which seems to live exactly the same life with the swallow and house-martin, should leave us before the middle of August invariably! while the latter stay often till the middle of October; once I even saw numbers of house-martins on the seventh of No-

vember. The martins, redwings, and fieldfares were flying in sight together; an uncommon assemblage of summer and winter birds!

[It is not easy to discover whether White really believes in the hybernation of swallows or not; he clings to the idea, and returns to it, although his own arguments seem to refute the notion almost as completely as those of any recent author. Writing twenty years later than the date of this letter, he tells us, in his Observations on Nature, March 23, 1788, that a gentleman who was this week on a visit at Waverly, took the opportunity of examining some of the holes in the sand-bank with which that district abounds. As these are undoubtedly bored by bank martins, and there they avowedly breed, he was in hopes that they might have slept there also, and that he might have surprised them just as they were waking from their winter slumbers. "When we had dug for some time," he says, "we found the holes were horizontal and serpentine, as I had observed before; and that the nests were deposited at the inner end, and had been occupied by broods in former summers, but no torpid birds were to be found. The same search was made many years ago with as little success." March 2, 1793, Mr. White adds, "A single sand-martin was seen hovering and playing round the sandpit at Short-heath, where they abound in summer. April 9, 1793, a sober herd assures me that this day he saw several on West Hanger com-

mon, between Hadleigh and Frensham, several sand-martins playing in and out and hanging before some nest-holes where the birds nestle.

"This incident confirms my suspicions, that this species of *hirundo* is to be seen the first of any, and gives reason to suppose that they do not leave their wild haunts at all, but are secreted amidst the clefts and caverns of these abrupt cliffs. The late severe weather considered, it is not very probable that these birds should have migrated so early from a tropical region, through all these cutting winds and pinching frosts; but it is easy to suppose that they may, like bats and flies, have been awakened by the influence of the sun, amidst their secret *latebræ* where they have spent the uncomfortable foodless months in a torpid state, and in the profoundest slumbers.

"There is a large pond at West Hanger which induces these sand-martins to frequent the district; for I have ever remarked that they haunt near great waters, either rivers or lakes."

A year later, he says, "During the severe winds that often prevail late in the spring, it is not easy to say how the *hirundines* subsist: for they withdraw themselves, and are hardly ever seen, nor do any insects appear for their support. That they can retire to rest and sleep away these uncomfortable periods as bats do, is a matter rather suspected than proved; or do they not rather spend their time in deep and

sheltered vales near waters where insects are to be found? Certain it is that hardly any individuals have, at such times, been seen for days together.

"September 13, 1791, the congregating flocks of *hirundines* on the church and tower are both beautiful and amusing. When they fly off together from the roof on any alarm, they quite swarm in the air. But they soon settle again in heaps, and pulling their feathers and lifting up their wings to admit the sun, they seem to enjoy the warm situation. Thus they spend the heat of the day, preparing for their migration, and, as it were, consulting when and where they are to go. The flight about the church seems to consist chiefly of house-martins, about 400 in number; but there are other places of rendezvous about the village frequented at the same time. It is remarkable that, though most of them sit on the battlements and roof, yet many of them hang or cling for some time by their claws against the surface of the walls in a manner not practised by them at other times of their remaining with us. The swallows seem to delight more in holding their assemblies on trees.

"November 3, 1789, the swallows were seen this morning, at Newton Vicarage house, hovering and settling on the roofs and outbuildings. None have been observed at Selborne since October 11. It is very remarkable that after the *hirundines* have disappeared for some weeks, a few are occasionally seen

again; sometimes in the first week of November, and that only for one day. Do they not withdraw and slumber in some hiding-place during the interval? for we cannot suppose they had migrated to warmer climes, and returned again for one day. Is it not more probable that they are awakened from sleep, and like the bats are come forth to collect a little food? These swallows looked like young ones."]

A little yellow bird (the *Motacilla trochilus*) still continues to make a sibilous shivering noise in the tops of tall woods. The *stoparola* of Ray is called, in your Zoology, the fly-catcher. There is one circumstance characteristic of this bird, which seems to have escaped observation, and that is, it takes its stand on the top of some stake or post, from whence it springs forth on its prey, catching a fly in the air, and hardly ever touching the ground, but returning still to the same stand for many times together.

I perceive there are more than one species of the *Motacilla* which visits us. Mr. Derham supposes, in Ray's "Philos. Letters," that he has discovered three. In these there is again an instance of some very common birds that have as yet no English name.

Mr. Stillingfleet makes a question whether the blackcap (*Motacilla atricapilla*) be a bird of passage or not: I think there is no doubt of it: for, in April, in the first fine weather, they come trooping, all at

once, into these parts, but are never seen in the winter. They are delicate songsters.

Numbers of snipes breed every summer in some moory ground on the verge of this parish. It is very amusing to see the cock bird on wing at that time, and to hear his piping and humming notes.

A snipe.

I have had no opportunity yet of procuring any of those mice which I mentioned to you in town. The person that brought me the last says they are plentiful in harvest, at which time I will take care to get more; and will endeavour to put it out of doubt whether it be a nondescript species or not.

I suspect much there may be two species of water-rats. Ray says, and Linnæus after him, that the water-rat is web-footed behind. Now I have discovered a rat on the banks of our little stream that is not web-footed, and yet is an excellent swimmer and diver: it answers exactly to the *Mus amphibius* of Linnæus, which, he says, swims and dives in ditches, "natat in fossis et urinatur." I should be glad to procure "one with the feet feathering out

like a palm," "*plantis palmatis*." Linnæus seems to be in a puzzle about his *Mus amphibius*, and to doubt whether it differs from his *Mus terrestris*, which if it be, as he allows, the "mus agrestis capite grandi brachyurus," a field-mouse, with "a large head and a short tail," is widely different from the water-rat, both in size, make, and manner of life.

As to the *falco*, which I mentioned in town, I shall take the liberty to send it down to you into Wales; presuming on your candour, that you will excuse me if it should appear as familiar to you as it is strange to me. "Though mutilated, such as you would say it had formerly been, seeing that the remains are what they are," "*qualem dices . . . antehac fuisse, tales cum sint reliquiæ!*"

It haunted a marshy piece of ground in quest of wild ducks and snipes; but when it was shot, had just knocked down a rook, which it was tearing in pieces. I cannot make it answer to any of our English hawks; neither could I find any like it at the curious exhibition of stuffed birds in Spring Gardens. I found it nailed up at the end of a barn, which is the countryman's museum.

The parish I live in is a very abrupt, uneven country, full of hills and woods, and therefore full of birds.

August 4, 1767.

[In severe weather, fieldfares, redwings, skylarks, and titlarks resort to watered meadows for food; the

latter wades up to its belly in pursuit of the pupæ of insects, and runs along upon the floating grass and weeds. Many gnats are on the snow near the water; these support the birds in part.

Birds are much influenced in their choice of food by colour, for though white currants are a much sweeter fruit than red, yet they seldom touch the former till they have devoured every bunch of the latter.

Redstarts, fly-catchers, and blackcaps arrive early in April. If these little delicate beings are birds of passage, how could they, feeble as they seem, bear up against such storms of snow and rain, and make their way through such meteorous turbulences as one should suppose would embarrass and retard the most hardy and resolute of the winged nation? Yet they keep their appointed times and seasons; and in spite of frosts and winds return to their stations periodically, as if they had met with nothing to obstruct them. The withdrawing and reappearing of the short-winged summer birds is a very puzzling circumstance in natural history!

When the boys bring me wasps' nests, my bantam fowls fare deliciously, and when the combs are pulled to pieces, devour the young wasps in their maggot state with the highest glee and delight. Any insect-eating bird would do the same. Birds of prey occasionally feed on insects: thus have I seen

a tame kite picking up the female ants full of eggs with much satisfaction.]—OBSERVATIONS ON NATURE.

LETTER XI.

TO THOMAS PENNANT, ESQ.

IT will not be without impatience that I shall wait for your thoughts with regard to the *falco;* as to its weight, breadth, &c. I wish I had set them down at the time; but, to the best of my remembrance, it weighed two pounds and eight ounces, and measured, from wing to wing, thirty-eight inches. Its cere and feet were yellow, and the circle of its eyelids a bright yellow. As it had been killed some days, and the eyes were sunk, I could make no good observation on the colour of the pupils and the irides.*

The most unusual birds I ever observed in these parts were a pair of Hoopoes (*upupa*), which came several years ago in the summer, and frequented an ornamented piece of ground, which joins to my garden, for some weeks. They used to march about in a stately manner, feeding in the walks many times in the day, and seemed disposed to breed in my outlet; but were frighted and persecuted by idle boys, who would never let them be at rest.

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* The irides are brown in all the British falcons.

Three grosbeaks (*Loxia coccothraustes*) appeared some years ago in my fields, in the winter; one of which I shot; since that, now and then, one is occasionally seen in the same dead season.

[Mr. B. shot a cock grosbeak which he had observed to haunt his garden for more than a fortnight. I began to accuse this bird of making sad havoc among the buds of the cherries, gooseberries, and wall-fruit of all the neighbouring orchards. Upon opening its crop or craw, however, no buds were to be seen, but a mass of kernels of the stones of fruits. Mr. B. observed that this bird frequented the spot where plum-trees grow; and that he had seen it with somewhat hard in its mouth, which it broke with difficulty; these were the stones of damsons. The Latin ornithologists call this bird *coccothraustes*, i. e., berry-breaker, because with its large horny beak it cracks and breaks the shells of stone-fruits for the sake of the seed or kernel. Birds of this sort are rarely seen in England, and only in winter.]—OBSERVATIONS ON NATURE.

A cross-bill (*Loxia curvirostra*) was killed last year in this neighbourhood.

Our streams, which are small, and rise only at the end of the village, yield nothing but the bull's head,* or miller's thumb (*Gobius fluviatilis capitatus*), the trout (*Trutta fluviatilis*), the eel (*anguilla*), the lam-

* *Salmo fario.* Linn.

pern (*Lampetra parva et fluviatilis*), and the stickleback (*Pisciculus aculeatus*).

We are twenty miles from the sea, and almost as many from a great river, and therefore see but little of sea-birds. As to wild fowls, we have a few teams of ducks bred in the moors where the snipes breed; and multitudes of widgeons and teals frequent our lakes in the forest in hard weather.

Having some acquaintance with a tame brown owl, I find that it casts up the fur of mice and the feathers of birds in pellets, after the manner of hawks: when full, like a dog, it hides what it cannot eat.

The young of the barn owl are not easily raised, as they want a constant supply of fresh mice: whereas the young of the brown owl will eat indiscriminately all that is brought; snails, rats, kittens, puppies, magpies, and any kind of carrion or offal.

The house-martins have eggs still, and squab-young. The last swift I observed was about the twenty-first of August; it was a straggler.

Redstarts, fly-catchers, white-throats, and gold-crested wrens, *reguli non cristati*, still appear; but I have seen no blackcaps lately.

I forgot to mention that I once saw, in Christ Church college quadrangle in Oxford, on a very sunny, warm morning, a house-martin flying about, and settling on the parapet, so late as the twentieth of November.

At present I know only two species of bats, the common *Vespertilio murinus* and the *Vespertilio auritus*.

I was much entertained last summer with a tame bat, which would take flies out of a person's hand. If you gave it anything to eat, it brought its wings round before the mouth, hovering and hiding its head in the manner of birds of prey when they feed. The adroitness it showed in shearing off the wings of flies, which were always rejected, was worthy of observation, and pleased me much. Insects seemed to be most acceptable, though it did not refuse raw flesh when offered: so that the notion that bats go down chimneys and gnaw men's bacon seems no improbable story. While I amused myself with this wonderful quadruped, I saw it several times confute the vulgar opinion, that bats when down on a flat surface cannot get on the wing again, by rising with great ease from the floor. It ran, I observed, with more despatch than I was aware of; but in a most ridiculous and grotesque manner.

Bats drink on the wing, like swallows, by sipping the surface, as they play over pools and streams. They love to frequent waters, not only for the sake of drinking, but on account of the insects which are found over them in the greatest plenty. As I was going, some years ago, pretty late, in a boat from Richmond to Sunbury, on a warm summer's evening, I think I saw myriads of bats between the two

places: the air swarmed with them all along the Thames, so that hundreds were in sight at a time.

SELBORNE, *Sept.* 9, 1767.

LETTER XII.

TO THOMAS PENNANT, ESQ.

IT gave me no small satisfaction to hear that the *falco* turned out an uncommon one. I must confess I should have been better pleased to have heard that I had sent you a bird that you had never seen before; but that I find would be a difficult task.

I have procured some of the mice mentioned in my former letters, a young one and a female with young, both of which I have preserved in brandy. From the colour, shape, size, and manner of nesting, I make no doubt but that the species is nondescript. They are much smaller, and more slender, than the *Mus domesticus medius* of Ray; and have more of the squirrel or dormouse colour: their belly is white; a straight line along their sides divides the shades of their back and belly. They never enter into houses; are carried into ricks and barns with the sheaves; abound in harvest; and build their nests amidst the straws of the corn above the ground, and sometimes in thistles. They breed as many as eight at a litter, in a little round nest, composed of the blades of grass or wheat.

One of these nests I procured this autumn, most artificially platted, and composed of the blades of wheat; perfectly round, and about the size of a cricket-ball; with the aperture so ingeniously closed, that there was no discovering to what part it belonged. It was so compact and well filled, that it would roll across the table without being discomposed, though it contained eight little mice that were naked and blind. As this nest was perfectly full, how could the dam come at her litter respectively, so as to administer a teat to each? Perhaps she opens different places for that purpose, adjusting them again when the business is over; but she could not possibly be contained herself in the ball with her young, which, moreover, would be daily increasing in bulk. This wonderful procreant cradle, and elegant instance of the efforts of instinct, was found in a wheatfield, suspended in the head of a thistle.

A gentleman curious in birds wrote me word that his servant had shot one last January, in that severe weather, which he believed would puzzle me. I called to see it this summer, not knowing what to expect: but the moment I took it in hand, I pronounced it the male *Garrulus Bohemicus*, or German silk-tail, from the five peculiar crimson tags or points which it carries at the ends of five of the short *remiges*. It cannot, I suppose, with any propriety be called an English bird: and yet I see, by Ray's "Philosophi-

cal Letters," that great flocks of them appeared in this kingdom in the winter of 1685, feeding on haws.

The mention of haws puts me in mind that there is a total failure of that wild fruit, so conducive to the support of many of the winged nation. For the same severe weather, late in the spring, which cut off all the produce of the more tender and curious trees, destroyed also that of the more hardy and common.

The great yew in the churchyard.

Some birds, haunting with the missel-thrushes, and feeding on the berries of the yew-tree, which answered to the description of the *Merula torquata*, or ring-ouzel, were lately seen in this neighbourhood. I employed some people to procure me a specimen, but without success.

Query.—Might not Canary-birds be naturalized to this climate, provided their eggs were put, in the spring, into the nests of some of their congeners, as goldfinches, greenfinches, &c.? Before winter per-

haps they might be hardened, and able to shift for themselves.

About ten years ago I used to spend some weeks yearly at Sunbury, which is one of those pleasant villages lying on the Thames, near Hampton Court. In the autumn, I could not help being much amused with those myriads of the swallow kind which assemble in those parts. But what struck me most was, that, from the time they began to congregate, forsaking the chimneys and houses, they roosted every night in the osier-beds of the aits of that river. Now this resorting towards that element, at that season of the year, seems to give some countenance to the northern opinion (strange as it is) of their retiring under water. A Swedish naturalist is so much persuaded of that fact, that he talks, in his "Calendar of Flora," as familiarly of the swallow's going under water in the beginning of September, as he would of his poultry going to roost a little before sunset.

An observing gentleman in London writes me word that he saw a house-martin, on the twenty-third of last October, flying in and out of its nest in the Borough: and I myself, on the twenty-ninth of last October (as I was travelling through Oxford), saw four or five swallows hovering round and settling on the roof of the county hospital.

Now, is it likely that these poor little birds (which perhaps had not been hatched but a few weeks) should, at that late season of the year, and

from so midland a county, attempt a voyage to Goree or Senegal, almost as far as the equator? I acquiesce entirely in your opinion—that, though most of the swallow kind may migrate, yet that some do stay behind, and hide with us during the winter.

As to the short-winged soft-billed birds which come trooping in such numbers in the spring, I am at a loss even what to think about them. I watched them narrowly this year, and saw them abound till about Michaelmas, when they appeared no longer. Subsist they cannot openly among us and yet elude the eyes of the inquisitive: and, as to their hiding, no man pretends to have found any of them in a torpid state in winter. But with regard to their migration, what difficulties attend that supposition: that such feeble bad fliers (who the summer long never flit but from hedge to hedge) should be able to traverse vast seas and continents, in order to enjoy milder seasons amidst the regions of Africa!

November 4. 1767.

LETTER XIII.

To Thomas Pennant, Esq.

As in one of your former letters you expressed the more satisfaction from my correspondence on account of my living in the most southerly county; so now I may return the compliment, and expect to

have my curiosity gratified by your living much more to the north.

For many years past I have observed that towards Christmas vast flocks of chaffinches have appeared in the fields; many more, I used to think, than could be hatched in any one neighbourhood. But, when I came to observe them more narrowly, I was amazed to find that they seemed to me to be almost all hens. I communicated my suspicions to some intelligent neighbours, who, after taking pains about the matter, declared that they also thought them mostly all females; at least fifty to one. This extraordinary occurrence brought to my mind the remark of Linnæus, that "before winter all their hen chaffinches migrate through Holland into Italy." Now I want to know, from some curious person in the north, whether there are any large flocks of these finches with them in the winter, and of which sex they mostly consist? For, from such intelligence, one might be able to judge whether our female flocks migrate from the other end of the island, or whether they come over to us from the Continent.

We have, in the winter, vast flocks of the common linnets; more, I think, than can be bred in any one district. These, I observe, when the spring advances, assemble on some tree in the sunshine, and join all in a gentle sort of chirping, as if they were about to break up their winter quarters and betake themselves to their proper summer homes. It is

well known, at least, that this is the signal of departure with the swallows and the fieldfares, which congregate with a gentle twittering before they take their respective departure.

You may depend on it that the bunting (*Emberiza miliaria*) does not leave this country in the winter. In January, 1767, I saw several dozen of them, in the midst of a severe frost, among the bushes on the downs near Andover: in our woodland inclosed district it is a rare bird.

Wagtails, both white and yellow, are with us all the winter. Quails crowd to our southern coast, and are often killed in numbers by people that go on purpose.

Mr. Stillingfleet, in his Tracts, says that "if the wheatear (*œnanthe*) does not quit England, it certainly shifts places; for about harvest they are not to be found, where there was before great plenty of them." This well accounts for the vast quantities that are caught about that time on the south downs near Lewes, where they are esteemed a delicacy. There have been shepherds, I have been credibly informed, that have made many pounds in a season by catching them in traps. And though such multitudes are taken, I never saw (and I am well acquainted with those parts) above two or three at a time: for they are never gregarious. They may perhaps migrate in general; and, for that purpose, draw towards the coast of Sussex in autumn: but that they do not all

withdraw I am sure: because I see a few stragglers in many counties, at all times of the year, especially about warrens and stone-quarries.

I have no acquaintance, at present, among the gentlemen of the navy: but have written to a friend, who was a sea-chaplain in the late war, desiring him to look into his minutes, with respect to birds that settled on their rigging during their voyage up or down the Channel. What Hasselquist says on that subject is remarkable: there were little short-winged birds frequently coming on board his ship all the way from our Channel quite up to the Levant, especially before squally weather.

What you suggest with regard to Spain is highly probable. The winters of Andalusia are so mild, that, in all likelihood, the soft-billed birds that leave us at that season, may find insects sufficient to support them there.

Some young men, possessed of fortune, health, and leisure, should make an autumnal voyage into that kingdom; and should spend a year there, investigating the natural history of that vast country. Mr. Willughby passed through that kingdom on such an errand; but he seems to have skirted along in a superficial manner and an ill-humour, being much disgusted at the rude dissolute manners of the people.

I have no friend left now at Sunbury to apply to about the swallows roosting on the aits of the

Thames: nor can I hear any more about those birds which I suspected were *Merulæ torquatæ.*

As to the small mice, I have further to remark, that though they hang their nests for breeding up amidst the straws of the standing corn, above the

A corn-rick in Norton farmyard.

ground; yet I find that, in the winter, they burrow deep in the earth, and make warm beds of grass: but their grand rendezvous seems to be in corn-ricks, into which they are carried at harvest. A neighbour housed an oat-rick lately, under the thatch of which were assembled near an hundred, most of which were taken; and some I saw. I measured them, and found

that from nose to tail, they were just two inches and a quarter, and their tails just two inches long. Two of them, in a scale, weighed down just one copper halfpenny, which is about the third of an ounce avoirdupois: so that I suppose they are the smallest quadrupeds in this island. A full grown *Mus medius domesticus* weighs, I find, one ounce lumping weight, which is more than six times as much as the mouse above; and measures from nose to rump four inches and a quarter, and the same in its tail. We have had a very severe frost and deep snow this month. My thermometer was one day fourteen degrees and a half below the freezing point, within doors. The tender evergreens were injured pretty much. It was very providential that the air was still, and the ground well covered with snow, else vegetation in general must have suffered prodigiously. There is reason to believe that some days were more severe than any since the year 1739–40.

SELBORNE, *Jan.* 22, 1768.

LETTER XIV.

TO THOMAS PENNANT, ESQ.

IF some curious gentleman would procure the head of a fallow deer, and have it dissected, he would find it furnished with two spiracula, or

breathing-places, besides the nostrils; probably analogous to the *puncta lachrymalia* in the human head. When deer are thirsty they plunge their noses, like some horses, very deep under water while in the act of drinking, and continue them in that situation for a considerable time: but to obviate any inconveniency, they can open two vents, one at the inner corner of each eye, having a communication with the nose. Here seems to be an extraordinary provision of nature worthy our attention; and which has not, that I know of, been noticed by any naturalist. For it looks as if these creatures would not be suffocated though both their mouths and nostrils were stopped. This curious formation of the head may be of singular service to beasts of chase, by affording them free respiration: and no doubt these additional nostrils are thrown open when they are hard run.* Mr. Ray observed that at Malta the owners slit up the nostrils of such asses as were hard worked: for they being naturally strait or small, did not admit air sufficient to serve them when they travelled, or laboured, in that hot climate. And we know that grooms, and gentlemen of the turf, think large nostrils necessary, and a perfection in hunters and running horses.

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* In answer to this account, Mr. Pennant sent me the following curious and pertinent reply:—"I was much surprised to find in the antelope something analogous to what you mention as so remarkable in deer. This animal also has a long slit beneath each eye, which can be opened and shut at pleasure. On holding an orange to one, the creature made as

Oppian, the Greek poet, by the following line, seems to have had some notion that stags have four spiracula:—

"Τετραδύμοί 'ρῖνες, πίσυρες πνοιήσι δίαυλοι."

"Quadrifidæ nares, quadruplices ad respirationem canales."
Opp. Cyn. Lib. ii. l. 181.

("Nostrils split in four divisions, fourfold passages for breathing.")

Writers, copying from one another, make Aristotle say that goats breathe at their ears; whereas he asserts just the contrary: "'Αλκμαίων γὰρ οὐκ ἀληθὴ λέγει, φάμενος ἀνάπνειν τὰς αἰγὰς κατὰ τὰ ὦτα." "Alcmæon does not advance what is true, when he avers that goats breathe through their ears."—HISTORY OF ANIMALS, Book i, ch. xi.

SELBORNE, *March* 12, 1768.

LETTER XV.

TO THOMAS PENNANT, ESQ.

SOME intelligent country-people have a notion that we have in these parts a species of the *genus mustelinum*, besides the weasel, stoat, ferret, and polecat; a little reddish beast, not much bigger than a

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much use of those orifices as of his nostrils, applying them to the fruit, and seeming to smell it through them."—WHITE.

field mouse, but much longer, which they call a cane. This piece of intelligence can be little depended on; but further inquiry may be made.

A gentleman in this neighbourhood had two milk-white rooks in one nest. A booby of a carter, finding them before they were unable to fly, threw them down and destroyed them, to the regret of the owner, who would have been glad to have preserved such a curiosity in his rookery. I saw the birds myself nailed against the end of a barn, and was surprised to find that their bills, legs, feet, and claws were milk-white.

A white rook.

[Rooks are continually fighting and pulling each other's nests to pieces: these proceedings are inconsistent with living in such close community. And yet if a pair offer to build on a single tree, the nest is plundered and demolished at once. Some rooks roost on their nest trees. The twigs which the rooks drop in building supply the poor with brushwood to light their fires. Some unhappy pairs are not permitted to finish any nest till the rest have completed their building. As soon as they get a few sticks together,

a party comes and demolishes the whole. As soon as rooks have finished their nests, and before they lay, the cocks begin to feed the hens, who receive their bounty with a fondling tremulous voice and fluttering wings, and all the little blandishments that are expressed by the young while in a helpless state. This gallant deportment of the males is continued through the whole season of incubation. These birds do not copulate on trees, nor in their nests, but on the ground in the open fields.] *

A shepherd saw, as he thought, some white larks on a down above my house this winter: were not these the *Emberiza nivalis*, the snow-flake of the Brit. Zool.? No doubt they were.

A few years ago I saw a cock bullfinch in a cage, which had been caught in the fields after it was come to its full colours. In about a year it began to look dingy; and blackening every succeeding year, it became coal-black at the end of four. Its chief food was hempseed. Such influence has food on the colour of animals! The pied and mottled colours of domesticated animals are supposed to be owing to high, various, and unusual food.

I had remarked for years that the root of the

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* After the first brood of rooks are sufficiently fledged, they all resort to some distant place in search of food, but return regularly every evening, in vast flights, to their nest trees, where, after flying round with much noise and clamour, till they are all assembled together, they take up their abode for the night.—MARKWICK.

cuckoo-pint (*arum*) was frequently scratched out of the dry banks of hedges, and eaten in severe snowy weather. After observing, with some exactness, myself, and getting others to do the same, we found it was the thrush kind that searched it out. The root of the *arum* is remarkably warm and pungent.

Our flocks of female chaffinches have not yet forsaken us. The blackbirds and thrushes are very much thinned down by that fierce weather in January.

In the middle of February I discovered, in my tall hedges, a little bird that raised my curiosity; it was of that yellow-green colour that belongs to the *salicaria* kind, and I think was soft-billed. It was no *parus;* and was too long and too big for the golden-crowned wren, appearing most like the largest willow-wren. It hung sometimes with its back downwards, but never continuing one moment in the same place. I shot at it, but it was so desultory that I missed my aim.

I wonder that the stone-curlew, *Charadrius oedicnemus*, should be mentioned by writers as a rare bird: it abounds in all the campaign parts of Hampshire and Sussex, and breeds, I think, all the summer, having young ones, I know, very late in the autumn. Already they begin clamouring in the evening. They cannot, I think, with any propriety be called, as they are by Mr. Ray, dwellers about streams or ponds, *circa aquas versantes;* for with us, by day at

least, they haunt only the most dry, open, upland fields and sheep-walks, far removed from water; what they may do in the night I cannot say. Worms are their usual food, but they also eat toads and frogs.

I can show you some good specimens of my new mice. Linnæus, perhaps, would call the species *Mus minimus*.

LETTER XVI.

To Thomas Pennant, Esq.

The history of the stone-curlew, *Charadrius oedicnemus*, is as follows. It lays its eggs, usually two, never more than three, on the bare ground, without any nest, in the field; so that the countryman, in stirring his fallows, often destroys them. The young run immediately from the egg like partridges, &c., and are withdrawn to some flinty field by the dam, where they skulk among the stones, which are their best security; for their feathers are so exactly of the colour of our grey-spotted flints, that the most exact observer, unless he catches the eye of the young bird, may be eluded. The eggs are short and round; of a dirty white, spotted with dark bloody blotches. Though I might not be able, just when I pleased, to procure you a bird, yet I could show you them almost any day; and any evening you may hear them round the village, for they make a clamour which

may be heard a mile. *Oedicnemus* is a most apt and expressive name for them, since their legs seem swollen like those of a gouty man. After harvest I have shot them before the pointers in turnip-fields.

I make no doubt but there are three species of the willow-wrens; two I know perfectly: but have not been able yet to procure the third. No two birds can differ more in their notes, and that constantly, than those two that I am acquainted with; for the one has a joyous, easy, laughing note; the other a harsh loud chirp. The former is every way larger, and three-quarters of an inch longer, and weighs two drams and a half, while the latter weighs but two; so the songster is one-fifth heavier than the chirper. The chirper (being the first summer bird of passage that is heard, the wryneck sometimes excepted) begins his two notes in the middle of March, and continues them through the spring and summer till the end of August, as appears by my journals. The legs of the larger of these two are flesh-coloured; of the less, black.

The grasshopper-lark began his sibilous note in my fields last Saturday. Nothing can be more amusing than the whisper of this little bird, which seems to be close by though at a hundred yards distance; and when close at your ear is scarce any louder than when a great way off. Had I not been a little acquainted with insects, and known that the grasshopper kind is not yet hatched, I should have

hardly believed but that it had been a *locusta* whispering in the bushes. The country people laugh when you tell them that it is the note of a bird. It is a most artful creature, skulking in the thickest part of a bush: and will sing at a yard distance, provided it be concealed. I was obliged to get a person to go on the other side of the hedge where it haunted: and then it would run, creeping like a mouse, before us for a hundred yards together, through the bottom of the thorns; yet it would not come into fair sight: but in a morning early, and when undisturbed, it sings on the top of a twig, gaping and shivering with its wings. Mr. Ray himself had no knowledge of this bird, but received his account from Mr. Johnson, who apparently confounds it with the *Reguli non cristati*, from which it is very distinct.

A bird's nest found.

The fly-catcher (*Stoparola*, Ray) has not yet appeared; it usually breeds in my vine. The redstart begins to sing: its note is short and imperfect, but is

continued till about the middle of June. The willow-wrens (the smaller sort) are horrid pests in a garden, destroying the peas, cherries, and currants, and are so tame that a gun will not scare them.*

My countrymen talk much of a bird that makes a clatter with its bill against a dead bough, or some old pales, calling it a jar-bird. I procured one to be shot in the very fact; it proved to be the nuthatch, (*Sitta Europœa*). Mr. Ray says that the less spotted woodpecker does the same. This noise may be heard a furlong or more off.

Now is the only time to ascertain the short-winged summer birds; for when the leaf is out there

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* A list of the Summer Birds of Passage discovered in this neighbourhood ranged somewhat in the order in which they appear:—

	LINNÆI NOMINA.
Smallest willow-wren,	*Motacilla trochilus.*
Wryneck,	*Junx torquilla.*
House-swallow,	*Hirundo rustica.*
Martin,	*Chelidon urbica.*
Sand-martin,	*Cotile riparia.*
Cuckoo,	*Cuculus canorus.*
Nightingale,	*Lusinia philomela.*
Blackcap,	*Motacilla atricapilla.*
Whitethroat,	*Motacilla sylvia.*
Middle willow-wren,	*Motacilla trochilus.*
Swift,	*Hirundo apus.*
Stone curlew, ?	*Charadrius oedicnemus.?*
Turtle-dove, ?	*Turtur aldrovandi.?*
Grasshopper-lark,	*Alauda trivialis.*
Landrail,	*Rallus crex.*
Largest willow-wren,	*Motacilla trochilus.*
Redstart,	*Ruticilla phœnicura.*
Goatsucker, or fern-owl,	*Caprimulgus Europœa.*
Fly-catcher,	*Muscicapa grisola.*

is no making any remarks on such a restless tribe: and when once the young begin to appear it is all confusion: there is no distinction of genus, species or sex.

In breeding-times snipes play over the moors, piping and humming: they always hum as they are descending. Is not their hum ventriloquous, like that of the turkey? Some suspect it is made by their wings.

This morning I saw the golden-crowned wren, whose crown glitters like burnished gold. It often hangs like a titmouse, with its back downwards.

SELBORNE, *April* 18, 1768.

LETTER XVII.

TO THOMAS PENNANT, ESQ.

ON Wednesday last arrived your agreeable letter of June the 10th. It gives me great satisfaction to find that you pursue these studies still with such vigour, and are in such forwardness with regard to reptiles and fishes.

The reptiles, few as they are, I am not acquainted with so well as I could wish, with regard to their natural history. There is a degree of dubiousness and obscurity attending the propagation of this class of animals, something analogous to that

of the cryptogamia in the sexual system of plants: and the case is the same with regard to some of the fishes; as the eel, &c.

The method in which toads procreate and bring forth seems to be very much in the dark. Some authors say that they are viviparous: and yet Ray classes them among his oviparous animals; and is silent with regard to the manner of their bringing forth. Perhaps they may be *ἔσω μὲν ὠοτόκοι, ἔξω δὲ ζωοτόκοι*, as is known to be the case with the viper. That of frogs is notorious to everybody: because we see them sticking upon each other's backs for a month together in the spring: and yet I never saw or read of toads being observed in the same situation. It is strange that the matter with regard to the venom of toads has not yet been settled. That they are not noxious to some animals is plain: for ducks, buzzards, owls, stone-curlews, and snakes eat them, to my knowledge, with impunity. And I well remember the time, but was not eye-witness to the fact (though numbers of persons were) when a quack at this village ate a toad to make the country-people stare; afterwards he drank oil.

I have been informed also, from undoubted authority, that some ladies (ladies you will say of peculiar taste) took a fancy to a toad, which they nourished summer after summer, for many years, with the maggots which turn to flesh flies, till he grew to a monstrous size. The reptile used to come

forth every evening from a hole under the garden steps; and was taken up on the table to be fed after supper. But at last a tame raven, kenning him as he put forth his head, gave him such a severe stroke with his horny beak as put out one eye. After this accident the creature languished for some time and died.

I need not remind a gentleman of your extensive reading of the excellent account there is from Mr. Derham, in Ray's "Wisdom of God in the Creation," concerning the migration of frogs from their breeding ponds. In this account he at once subverts that foolish opinion of their dropping from the clouds in rain; showing that it is from the grateful coolness and moisture of those showers that they are tempted to set out on their travels, which they defer till those fall. Frogs are as yet in their tadpole state; but in a few weeks our lanes, paths, fields, will swarm for a few days with myriads of those emigrants, no larger than my little finger nail. Swammerdam gives a most accurate account of the method and situation in which the male impregnates the spawn of the female. How wonderful is the economy of Providence with regard to the limbs of so vile a reptile! While it is an aquatic, or in a tadpole state, it has a fish-like tail, and no legs: as soon as the legs sprout, the tail drops off as useless, and the animal betakes itself to the land.*

* The tail of the tadpole does not drop off; it is absorbed.

Merrit, I trust, is widely mistaken when he advances that the *Rana arborea* is an English reptile; it abounds in Germany and Switzerland.

It is to be remembered that the *Salamandra aquatica* of Ray (the water-newt, or eft) will frequently bite at the angler's bait, and is often caught on his hook. I used to take it for granted that the *Salamandra aquatica* was hatched, lived, and died, in the water. But John Ellis, Esq., F. R. S. (the coralline Ellis), asserts, in a letter to the Royal Society, dated June 5th, 1766, in his account of the *Mud inguana*, an amphibious bipes from South Carolina, that the water-eft, or newt, is only the larva of the land-eft, as tadpoles are of frogs. Lest I should be suspected of misunderstanding his meaning, I shall give it in his own words. Speaking of the opercula or coverings to the gills of the *Mud inguana*, he proceeds to say that "the form of these pennated coverings approaches very near to what I have some time ago observed in the larva or aquatic state of our English *Lacerta*, known by the name of eft or newt: which serve them for coverings to their gills, and for fins to swim with while in this state; and which they lose, as well as the fins of their tails, when they change their state and become land animals, as I have observed, by keeping them alive for some time myself."

Linnæus, in his "Systema Naturæ," hints more than once at what Mr. Ellis advances.

Providence has been so indulgent to us as to allow of but one venomous reptile of the serpent kind in these kingdoms, and that is the viper. As you propose the good of mankind to be an object of your publications, you will not omit to mention common salad-oil as a sovereign remedy against the bite of the viper. As to the blind worm (*Anguis fragilis*, so called because it snaps in sunder with a small blow), I have found on examination that it is perfectly innocuous. A neighbouring yeoman (to whom I am indebted for some good hints) killed and opened a female viper about the 27th of May; he found her filled with a chain of eleven eggs, about the size of those of a blackbird; but none of them were advanced so far towards a state of maturity as to contain any rudiments of young. Though they are oviparous, yet they are viviparous also, hatching their young within their bellies, and then bringing them forth. Whereas snakes lay chains of eggs every summer in my melon-beds, in spite of all that my people can do to prevent them; which eggs do not hatch till the spring following, as I have often experienced. Several intelligent folks assure me that they have seen the viper open her mouth and admit her helpless young down her throat on sudden surprises, just as the female opossum does her brood into the pouch under her belly, upon the like emergencies; and yet the London viper-catchers insist on it, to Mr. Barrington, that no such thing

ever happens. The serpent kind eat, I believe, but once in a year; or, rather, but only just at one season of the year. Country people talk much of a water-snake, but, I am pretty sure, without any reason; for the common snake (*Coluber natrix*) delights much to sport in the water, perhaps with a view to procure frogs and other food.

I cannot well guess how you are to make out your twelve species of reptiles, unless it be the various species, or rather varieties, of our *Lacerti*, of which Ray enumerates five. I have not had opportunity of ascertaining these; but remember well to have seen, formerly, several beautiful green *Lacerti* on the sunny sandbanks near Farnham, in Surrey; and Ray admits there are such in Ireland.

SELBORNE, *June* 18, 1768.

LETTER XVIII.

TO THOMAS PENNANT, ESQ.

I RECEIVED your obliging and communicative letter of June the 28th, while I was on a visit at a gentleman's house, where I had neither books to turn to nor leisure to sit down to return you an answer to many queries, which I wanted to resolve in the best manner that I am able.

A person, by my order, has searched our brooks,

but could find no such fish as the *Gasterosteus pungitius:* he found the *Gasterosteus aculeatus* in plenty. This morning, in a basket, I packed a little

The butcher's shop.

earthen pot full of wet moss, and in it some sticklebacks, male and female; the females big with spawn: some lamperns; some bullheads; but I could procure no minnows. This basket will be in Fleet Street by eight this evening; so I hope

Mazel * will have them fresh and fair to-morrow morning. I gave some directions in a letter to what particulars the engraver should be attentive.

Finding, while I was on a visit, that I was within a reasonable distance of Ambresbury, I sent a servant over to that town, and procured several living specimens of loaches, which he brought, safe and brisk, in a glass decanter. They were taken in the gullies that were cut for watering the meadows. From these fishes (which measured from two to four inches in length) I took the following description :— "The loach, in its general aspect, has a pellucid appearance ; its back is mottled with irregular collections of small black dots, not reaching much below the *linea lateralis*, as are the back and tail fins : a black line runs from each eye down to the nose ; its belly is of a silvery white ; the upper jaw projects beyond the lower, and is surrounded with six feelers, three on each side ; its pectoral fins are large, its ventral much smaller ; the fin behind its anus small ; its dorsal fin large, containing eight spines ; its tail, where it joins to the tail-fin, remarkably broad, without any taperness, so as to be characteristic of this genus : the tail-fin is broad, and square at the end. From the breadth and muscular strength of the tail it appears to be an active nimble fish."

In my visit I was not very far from Hungerford,

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* Mr. Peter Mazel was the engraver of Pennant's plates.

and did not forget to make some inquiries concerning the wonderful method of curing cancers by means of toads. Several intelligent persons, both gentry and clergy, do, I find, give a great deal of credit to what was asserted in the papers; and I myself dined with a clergyman who seemed to be persuaded that what is related is matter of fact; but when I came to attend to his account, I thought I discerned circumstances which did not a little invalidate the woman's story of the manner in which she came by her skill. She says of herself: "that labouring under a virulent cancer, she went to some church where there was a vast crowd: on going into a pew, she was accosted by a strange clergyman; who, after expressing compassion for her situation, told her that if she would make such an application of living toads as is mentioned she would be well." Now is it likely that this unknown gentleman should express so much tenderness for this single sufferer, and not feel any for the many thousands that daily languish under this terrible disorder? Would he not have made use of this invaluable nostrum for his own emolument; or, at least, by some means of publication or other, have found a method of making it public for the good of mankind? In short, this woman (as it appears to to me) having set up for a cancer-doctress, finds it expedient to amuse the country with this dark and mysterious relation.

The water-eft has not, that I can discern, the least appearance of any gills; for want of which it is continually rising to the surface of the water to take in fresh air. I opened a big-bellied one indeed, and found it full of spawn. Not that this circumstance at all invalidates the assertion that they are larvæ; for the larvæ of insects are full of eggs, which they exclude the instant they enter their last state. The water-eft is continually climbing over the brims of the vessel within which we keep it in water, and wandering away; and people every summer see numbers crawling out of the pools where they are hatched, up the dry banks. There are varieties of them, differing in colour; and some have fins up their tail and back, and some have not.

SELBORNE, *July* 27, 1768.

LETTER XIX.

TO THOMAS PENNANT, ESQ.

I HAVE now, past dispute, made out three distinct species of the willow-wrens (*Motacillæ trochili*) which constantly and invariably use distinct notes; but, at the same time, I am obliged to confess that I know nothing of your willow-lark.* In my letter of

* Brit. Zool., edit. 1776, octavo, p. 381.

April the 18th, I had told you peremptorily that I knew your willow-lark, but had not seen it then: but when I came to procure it, it proved, in all respects, a very *Motacilla trochilus;** only that it is a size larger than the other two, and the yellow-green of the whole upper part of the body is more vivid, and the belly of a clearer white. I have specimens of three sorts now lying before me, and can discern that there are three gradations of sizes, and that the least has black legs, and the other two flesh-coloured ones. The yellowest bird is considerably the largest, and has its quill feathers and secondary feathers tipped with white, which the others have not. This last haunts only the tops of trees in high beechen woods, and makes a sibilous grasshopper-like noise, now and then, at short intervals, shivering a little with its wings when it sings; and is, I make no doubt now, the *Regulus non cristatus* of Ray; which he says "cantat voce stridulâ locustæ." Yet this great ornithologist never suspected that there were three species.

SELBORNE, *Aug.* 17, 1768.

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* Hedge-warbler (see Letter XXVI.): *Sylvia loquax*, black legs; *Sylvia trochilus*, yellowish belly; *Sylvia sibilatrix*, white belly.

LETTER XX.

To Thomas Pennant, Esq.

It is, I find, in zoology as it is in botany: all nature is so full, that that district produces the greatest variety which is the most examined. Several birds, which are said to belong to the north only, are, it seems, often in the south. I have discovered this summer three species of birds with us, which writers mention as only to be seen in the northern counties. The first that was brought me (on the 14th of May) was the sandpiper (*Tringa hypoleucus*): it was a cock bird, and haunted the banks of some ponds near the village; and as it had a companion, doubtless intended to have bred near that water. Besides, the owner has told me since, that, on recollection, he has seen some of the same birds round his ponds in former summers.

The next bird that I procured (on the 21st of May) was a male red-back butcher bird (*Lanius collurio*). My neighbour who shot it says that it might easily have escaped his notice, had not the outcries and chattering of the white-throats and other small birds drawn his attention to the bush where it was: its craw was filled with legs and wings of beetles.

The next rare birds (which were procured for me last week) were some ring-ousels (*Turdus torquatus*).

This week twelve months a gentleman from Lon-

don being with us, was amusing himself with a gun, and found, he told us, on an old yew hedge where

A friendly chat on Selborne street.

there were berries, some birds like blackbirds, with rings of white round their necks: a neighbouring farmer also at the same time observed the same; but, as no specimens were procured, little notice was taken. I mentioned this circumstance to you in my

letter of November the 4th, 1767. Last week the aforesaid farmer, seeing a large flock, twenty or thirty, of these birds, shot two cocks and two hens: and says, on recollection, that he remembers to have observed these birds last spring, about Lady-day, as it were, on their return to the north. If these birds should prove the ousels of the north of England, then here is a migration disclosed within our own kingdom never before remarked. It does not yet appear whether they retire beyond the bounds of our island to the south; but it is most probable that they usually do, or else one cannot suppose that they would have continued so long unnoticed in the southern counties. The ousel is larger than a blackbird, and feeds on haws; but last autumn (when there were no haws) it fed on yew-berries; in the spring it feeds on ivy-berries, which ripen only at that season, in March and April.

I must not omit to tell you (as you have been lately on the study of reptiles) that my people, every now and then of late, draw up with a bucket of water from my well, which is 63 feet deep, a large black warty lizard, with a fin-tail and yellow belly. How they first came down at that depth, and how they were ever to have got out thence without help, is more than I am able to say.

My thanks are due to you for your trouble and care in the examination of a buck's head. As far as your discoveries reach at present, they seem much

to corroborate my suspicions; and I hope Mr. Hunt may find reason to give his decision in my favour; and then, I think, we may advance this extraordinary provision of nature as a new instance of the wisdom of God in the creation.

As yet I have not quite done with my history of the *œdicnemus*, or stone-curlew; for I shall desire a gentleman in Sussex (near whose house these birds congregate in vast flocks in the autumn) to observe nicely when they leave him (if they do leave him), and when they return again in the spring: I was with this gentleman lately, and saw several single birds.

SELBORNE, *Oct.* 8, 1768.

LETTER XXI.

TO THOMAS PENNANT, ESQ.

WITH regard to the *œdicnemus*, or stone-curlew, I intend to write very soon to my friend near Chichester, in whose neighbourhood these birds seem most to abound; and shall urge him to take particular notice when they begin to congregate, and afterwards to watch them most narrowly, whether they do not withdraw themselves during the dead of the winter. When I have obtained information with respect to this circumstance, I shall have finished

my history of the stone-curlew; which I hope will prove to your satisfaction, as it will be, I trust, very near the truth.

It is very extraordinary, as you observe, that a bird so common with us should never straggle to you.

After a lapse of twenty years, Mr. White adds: [On the 27th of February, 1788, stone-curlews were heard to pipe; and on March 1st, after it was dark, some were passing over the village, as might be perceived from their quick short note, which they use in their nocturnal excursions by way of watchword, that they may not stray and lose their companions.

Thus, we see, that retire whithersoever they may in the winter, they return again early in the spring, and are, as it now appears, the first summer birds that come back. Perhaps the mildness of the season may have quickened the emigration of the curlews this year.

They spend the day in high elevated fields and sheep-walks; but seem to descend in the night to streams and meadows, perhaps for water, which their upland haunts do not afford them.]—OBSERVATIONS ON NATURE.

And here will be the properest place to mention, while I think of it, an anecdote which the above-mentioned gentleman told me when I was last at his house; which was that, in a warren joining to his outlet, many daws (*Corvi monedulæ*) build every year

Stonehenge.

in the rabbit-burrows under ground. The way he and his brothers used to take their nests, while they were boys, was by listening at the mouths of the holes; and if they heard the young ones cry, they twisted the nest out with a forked stick. Some water-fowls (viz. the puffins) breed, I know, in that manner; but I should never have suspected the daws of building in holes on the flat ground.

Another very unlikely spot is made use of by daws as a place to breed in, and that is Stonehenge. These birds deposit their nests in the interstices between the upright and the impost stones of that amazing work of antiquity: which circumstance alone speaks the prodigious height of the upright stones, that they should be tall enough to secure those nests from the annoyance of shepherd boys, who are always idling round that place.

One of my neighbours last Saturday, November the 26th, saw a martin in a sheltered bottom: the sun shone warm, and the bird was hawking briskly after flies. I am now perfectly satisfied that they do not all leave this island in the winter.

You judge very right, I think, in speaking with reserve and caution concerning the cures done by toads; for, let people advance what they will on such subjects, yet there is such a propensity in mankind towards deceiving and being deceived, that one cannot safely relate anything from common

report, especially in print, without expressing some degree of doubt and suspicion.

Your approbation, with regard to my new discovery of the migration of the ring-ousel, gives me satisfaction; and I find you concur with me in suspecting that they are foreign birds which visit us. You will be sure, I hope, not to omit to make inquiry whether your ring-ousels leave your rocks in the autumn. What puzzles me most is the very short stay they make with us; for in about three weeks they are all gone. I shall be very curious to remark whether they will call on us at their return in the spring, as they did last year.

I want to be better informed with regard to icthyology. If fortune had settled me near the sea-side, or near some great river, my natural propensity would soon have urged me to have made myself acquainted with their productions: but as I have lived mostly in inland parts, and in an upland district, my knowledge of fishes extends little farther than to those common sorts which our brooks and lakes produce.

SELBORNE, *Nov* 28, 1768.

LETTER XXII.

To Thomas Pennant, Esq.

As to the peculiarity of jackdaws building with us under the ground in rabbit-burrows, you have, in part, hit upon the reason; for, in reality, there are hardly any towers or steeples in all this country. And perhaps, Norfolk excepted, Hampshire and Sussex are as meanly furnished with churches as almost any counties in the kingdom. We have many livings of two or three hundred pounds a year whose houses of worship make little better appearance than dove-cots. When I first saw Northamptonshire, Cambridgeshire, and Huntingdonshire, and the fens of Lincolnshire, I was amazed at the number of spires which presented themselves from every point of view. As an admirer of prospects, I have reason to lament this want in my own country; for such objects are very necessary ingredients in an elegant landscape.

What you mention with respect to reclaimed toads raises my curiosity. An ancient author, though no naturalist, has well remarked that, "Every kind of beasts, and of birds, and of serpents, and things in the sea, is tamed, and hath been tamed, of mankind" (James iii. 7).

It is a satisfaction to me to find that a green lizard has actually been procured for you in Devon-

shire; because it corroborates my discovery, which I made many years ago, of the same sort, on a sunny sandbank near Farnham in Surrey. I am well acquainted with the south hams of Devonshire; and can suppose that district, from its southerly situation, to be a proper habitation for such animals in their best colours.

Since the ring-ousels of your vast mountains do certainly not forsake them against winter, our suspicions that those which visit this neighbourhood about Michaelmas are not English birds, but are driven from the more northern parts of Europe by the frosts, are still more reasonable; and it will be worth your pains to endeavour to trace from whence they come, and to inquire why they make so very short a stay.

In the account you gave me of your error with regard to the two species of herons, you incidentally gave me great entertainment in your description of the heronry at Cressi Hall; which is a curiosity I never could manage to see. Fourscore nests of such a bird on one tree is a rarity which I would ride half as many miles to get a sight of. Pray tell me in your next whose seat Cressi Hall is, and near what town it lies.* I have often thought that those vast fens have not been sufficiently explored. If half a dozen gentlemen, furnished with a good strength of

* Cressi Hall is near Spalding, in Lincolnshire.

water-spaniels, were to beat them over for a week, they would certainly find more species.

There is no bird whose manners I have studied more than that of the *caprimulgus* (the goat-sucker): it is a wonderful and curious creature, but I have always found that though sometimes it may chatter as it flies, as I know it does, yet in general it utters its jarring note sitting on a bough; and I have for many a half-hour watched it as it sat with its under mandible quivering, and particularly this summer. It perches usually on a bare twig, with its head lower than its tail, in an attitude well expressed by your draughtsman in the folio "British Zoology." This bird is most punctual in beginning its song exactly at the close of day; so exactly that I have known it strike up more than once or twice just at the report of the Portsmouth evening gun, which we can hear when the weather is still. It appears to me past all doubt that its notes are formed by organic impulse, by the powers of the parts of its windpipe formed for sound, just as cats purr. You will credit me, I hope, when I assure you that as my neighbours were assembled in a hermitage on the side of a steep hill, where we drink tea sometimes, one of these churn-owls came and settled on the cross of that little straw edifice and began to chatter, and continued his note for many minutes; and we were all struck with wonder to find that the organs of the little animal, when put in motion, gave

a sensible vibration to the whole building! This bird also sometimes makes a small squeak, repeated four or five times; and I have observed that to happen when the cock has been pursuing the hen in a toying way through the boughs of a tree.

After a lapse of twenty years the author adds the following to his "History of the Fern-owl or Goat-sucker:"—

[The country people have a notion that the fern-owl, or churn-owl, or eve-jarr, which they also call a puckeridge, is very injurious to weanling calves, by inflicting, as it strikes at them, the fatal distemper known to cow-leeches by the name of puckeridge. Thus does this harmless ill-fated bird fall under a double imputation which it by no means deserves—in Italy, of sucking the teats of goats, whence it is called *caprimulgus;* and with us of communicating a deadly disorder to cattle. But the truth of the matter is, the malady above mentioned is occasioned by the *Œstrus bovis*, a dipterous insect, which lays its eggs along the chines of kine, where the maggots, when hatched, eat their way through the hide of the beast into the flesh, and grow to a very large size. I have just talked with a man, who says he has more than once stripped calves who have died of the puckeridge; that the ail or complaint lay along the chine, where the flesh was much swelled, and filled with purulent matter. I myself once saw a large rough maggot of this sort squeezed out of

the back of a cow. In Essex these maggots are called wornills.

The least observation and attention would convince men that these birds neither injure the goatherd nor the grazier, but are perfectly harmless, and subsist alone, being night birds, on night insects, such as *scarabæi* and *phalænæ;* and through the month of July mostly on the *Scarabæus solstitialis*, which in many districts abounds at that season. Those that we have opened have always had their craws stuffed with large night moths and their eggs, and pieces of chafers: nor does it anywise appear how they can, weak and unarmed as they seem, inflict any harm upon kine, unless they possess the powers of animal magnetism, and can affect them by fluttering over them.

A fern-owl this evening (August 27) showed off in a very unusual and entertaining manner, by hawking round and round the circumference of my great spreading oak for twenty times following, keeping mostly close to the grass, but occasionally glancing up amidst the boughs of the tree. This amusing bird was then in pursuit of a brood of some particular *phalæna* belonging to the oak, of which there are several sorts; and exhibited on the occasion a command of wing superior, I think, to that of the swallow itself.

When a person approaches the haunt of fern-owls in an evening, they continue flying round the head

of the obtruder; and by striking their wings together above their backs, in the manner that the pigeons called smiters are known to do, make a smart snap: perhaps at that time they are jealous for their young; and their noise and gesture are intended by way of menace.

Fern-owls seem to have an attachment to oaks, no doubt on account of food; for the next evening we saw one again several times among the boughs of the same tree; but it did not skim round its stem over the grass, as on the evening before. In May these birds find the *Scarabæus melolontha* on the oak; and the *Scarabæus solstitialis* at midsummer; but they can only be watched and observed for two hours in the twenty-four; and then in a dubious twilight an hour after sunset and an hour before sunrise.

On this day (July 14, 1789) a woman brought me two eggs of a fern-owl or eve-jarr, which she found on the verge of the Hanger, to the left of the hermitage, under a beechen shrub. This person, who lives just at the foot of the Hanger, seems well acquainted with these nocturnal swallows, and says she has often found their eggs near that place, and that they lay only two at a time on the bare ground. The eggs were oblong, dusky, and streaked somewhat in the manner of the plumage of the parent bird, and were equal in size at each end. The dam was sitting on the eggs when found, which contained the rudiments of young, and would have been

hatched perhaps in a week. From hence we may see the time of their breeding, which corresponds pretty well with that of the swift, as does also the period of their arrival. Each species is usually seen about the beginning of May. Each breeds but once in a summer; and each lays only two eggs.

July 4, 1790. The woman who brought me two fern-owls' eggs last year on July 14, on this day produced me two more, one of which had been laid this morning, as appears plainly, because there was only one in the nest the evening before. They were found, as last July, on the verge of the down above the hermitage under a beechen shrub, on the naked ground. Last year those eggs were full of young, and just ready to be hatched.

These circumstances point out the exact time when these curious nocturnal migratory birds lay their eggs, and hatch their young. Fern-owls, like snipes, stone-curlews, and some other birds, make no nest. Birds that build on the ground do not make much of their nests.]—OBSERVATIONS ON NATURE.

It would not be at all strange if the bat, which you have procured, should prove a new one, since five species have been found in a neighbouring kingdom. The great sort that I mentioned is certainly a nondescript: I saw but one this summer, and that I had no opportunity of taking.

Your account of the Indian grass was entertaining. I am no angler myself; but inquiring of those

that are what they supposed that part of their tackle to be made of, they replied "of the intestines of a silkworm."

Though I must not pretend to great skill in entomology, yet I cannot say that I am ignorant of that kind of knowledge: I may now and then perhaps be able to furnish you with a little information.

The vast rains ceased with us much about the same time as with you, and since then we have had delicate weather. Mr. Barker, who has measured the rain for more than thirty years, says, in a late letter, that more has fallen this year than in any he ever attended to; though from July, 1763, to January, 1764, more fell than in any seven months of this year.

SELBORNE, *Jan.* 2, 1769.

LETTER XXIII.

TO THOMAS PENNANT, ESQ.

IT is not improbable that the Guernsey lizard and our green lizards may be specifically the same; all that I know is, that, when some years ago many Guernsey lizards were turned loose in Pembroke College garden, in the university of Oxford, they lived a great while, and seemed to enjoy themselves very well, but never bred. Whether this circum-

stance will prove anything either way I shall not pretend to say.

I return you thanks for your account of Cressi Hall; but recollect, not without regret, that in June, 1746, I was visiting for a week together at Spalding, without ever being told that such a curiosity was just at hand. Pray tell me in your next what sort of tree it is that contains such a quantity of herons' nests; and whether the heronry consists of a whole grove or wood, or only of a few trees.

It gave me satisfaction to find we accorded so well about the *caprimulgus:* all I contended for was to prove that it often chatters sitting as well as flying; and therefore the noise was voluntary, and from organic impulse, and not from the resistance of the air against the hollow of its mouth and throat.

If ever I saw anything like actual migration, it was last Michaelmas Day. I was travelling, and out early in the morning: at first there was a vast fog; but by the time that I was got seven or eight miles from home towards the coast, the sun broke out into a delicate warm day. We were then on a large heath or common, and I could discern, as the mist began to break away, great numbers of swallows (*Hirundines rusticæ*) clustering on the stunted shrubs and bushes, as if they had roosted there all night. As soon as the air became clear and pleasant they all were on the wing at once; and, by a placid and easy flight, proceeded on southward towards the

sea: after this I did not see any more flocks, only now and then a straggler.

I cannot agree with those persons who assert that the swallow kind disappear gradually, as they come, for the bulk of them seem to withdraw at once: only some few stragglers stay behind a long while, and never, there is reason to believe, leave this island. Swallows seem to lay themselves up, and to come forth in a warm day, as bats do continually of a warm evening after they have disappeared for weeks. For a very respectable gentleman assured me that, as he was walking with some friends under Merton wall on a remarkably hot noon, either in the last week in December or the first week in January, he espied three or four swallows huddled together on the moulding of one of the windows of that college. I have frequently remarked that swallows are seen later at Oxford than elsewhere: is this owing to the vast massy buildings of that place, to the many waters round it, or to what else?

When I used to rise in a morning last autumn, and see the swallows and martins clustering on the chimneys and thatch of the neighbouring cottages, I could not help being touched with a secret delight, mixed with some degree of mortification: with delight, to observe with how much ardour and punctuality those poor little birds obeyed the strong impulse towards migration, or hiding, imprinted on their minds by their great Creator; and with some

degree of mortification, when I reflected that, after all our pains and inquiries, we are yet not quite cer-

Cottages next to "The Wakes."

tain to what regions they do migrate; and are still farther embarrassed to find that some do not actually migrate at all.

These reflections made so strong an impression on my imagination, that they became productive of a composition that may perhaps amuse you for a quarter of an hour when next I have the honour of writing to you.

SELBORNE, *February* 28, 1769.

LETTER XXIV.

To Thomas Pennant, Esq.

The *Scarabæus fullo* I know very well, having seen it in collections; but have never been able to discover one wild in its natural state. Mr. Banks told me he thought it might be found on the sea coast.

On the 13th of April I went to the sheep-down, where the ring-ousels have been observed to make their appearance at spring and fall, in their way perhaps to the north or south; and was much pleased to see three birds about the usual spot. We shot a cock and a hen; they were plump and in high condition. The hen had but very small rudiments of eggs within her, which proves they are late breeders; whereas those species of the thrush kind that remain with us the whole year have fledged young before that time. In their crops was nothing very distinguishable, but somewhat that seemed like blades of vegetables nearly digested. In autumn they feed on haws and yew-berries, and in the spring on ivy-berries. I dressed one of these birds, and found it juicy and well-flavoured. It is remarkable that they only stay a few days in their spring visit, but rest nearly a fortnight at Michaelmas. These birds, from the observations of three springs and two autumns, are most punctual in their return; and

exhibit a new migration unnoticed by the writers, who supposed they never were to be seen in any of the southern counties.

One of my neighbours lately brought me a new *Salicaria*, which at first I suspected might have proved your willow-lark;* but, on a nicer examination, it answered much better to the description of that species which you shot at Revesby, in Lincolnshire. My bird I describe thus:—"It is a size less than the grasshopper-lark; the head, back, and coverts of the wings of a dusky brown, without those dark spots of the grasshopper-lark; over each eye is a milkwhite stroke; the chin and throat are white, and the under parts of a yellowish white: the rump is tawny, and the feathers of the tail sharp-pointed; the bill is dusky and sharp, and the legs are dusky; the hinder claw long and crooked." The person that shot it says that it sung so like a reed-sparrow that he took it for one; and that it sings all night: but this account merits farther inquiry. For my part, I suspect it as a second sort of *locustella*, hinted at by Dr. Derham in "Ray's Letters." He also procured me a grasshopper-lark.

The question that you put with regard to those genera of animals that are peculiar to America, viz. how they came there, and whence? is too puzzling for me to answer; and yet so obvious as often to

* For this *Salicaria*, or sedge-warbler, see Letter XXVI. August 30, 1769.

have struck me with wonder. If one looks into the writers on that subject little satisfaction is to be found. Ingenious men will readily advance plausible arguments to support whatever theory they shall choose to maintain; but then the misfortune is, every one's hypothesis is each as good as another's, since they are all founded on conjecture. The late writers of this sort, in whom may be seen all the arguments of those that have gone before, as I remember, stock America from the western coast of Africa and the south of Europe; and then break down the Isthmus that bridged over the Atlantic. But this is making use of a violent piece of machinery: it is a difficulty worthy of the interposition of a god! "Incredulus odi." "I feel disgusted and disbelieving."

THE NATURALIST'S SUMMER-EVENING WALK.

———"*equidem credo, quia sit divinitus illis*
Ingenium." *—VIRG. *Georg.* i. 415, 416.

WHEN day declining sheds a milder gleam,
What time the May-fly haunts the pool or stream;
When the still owl skims round the grassy mead,
What time the timorous hare limps forth to feed:
Then be the time to steal adown the vale,
And listen to the vagrant cuckoo's tale;
To hear the clamorous curlew † call his mate,
Or the soft quail his tender pain relate;
To see the swallow sweep the dark'ning plain
Belated, to support her infant train;
To mark the swift in rapid giddy ring
Dash round the steeple, unsubdued of wing:

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* "I think their instinct is divinely bestowed."

† *Charadrius oedicnemus.*

Beeches in the long lythe.
The lythe was a favorite walk of White's.

Amusive birds! say where your hid retreat
When the frost rages and the tempests beat;
Whence your return, by such nice instinct led,
When spring, soft season, lifts her bloomy head?
Such baffled searches mock man's prying pride,
The GOD of NATURE is your secret guide!
  While deep'ning shades obscure the face of day
To yonder bench leaf-shelter'd let us stray,
Till blended objects fail the swimming sight,
And all the fading landscape sinks in night;
To hear the drowsy dorr come brushing by
With buzzing wing, or the shrill cricket * cry;
To see the feeding bat glance through the wood;
To catch the distant falling of the flood;
While o'er the cliff th' awaken'd churn-owl hung
Through the still gloom protracts his chattering song;
While high in air, and pois'd upon his wings,
Unseen, the soft enamour'd woodlark sings:
These, NATURE'S works, the curious mind employ,
Inspire a soothing melancholy joy:
As fancy warms, a pleasing kind of pain
Steals o'er the cheek, and thrills the creeping vein!
  Each rural sight, each sound, each smell combine;
The tinkling sheep-bell, or the breath of kine;
The new-mown hay that scents the swelling breeze,
Or cottage-chimney smoking through the trees.
  The chilling night-dews fall:—away, retire;
For see, the glowworm lights her amorous fire!
Thus, ere night's veil had half obscured the sky,
Th' impatient damsel hung her lamp on high:
True to the signal, by love's meteor led,
Leander hasten'd to his Hero's bed.

SELBORNE, *May* 29, 1769.

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* *Gryllus campestris.*

LETTER XXV.

To the Honourable Daines Barrington.

When I was in town last month I partly engaged that I would some time do myself the honour to write to you on the subject of natural history: and I am the more ready to fulfil my promise, because I see you are a gentleman of great candour, and one that will make allowances; especially where the writer professes to be an out-door naturalist, one that takes his observations from the subject itself, and not from the writings of others.

The following is a list of the summer birds of passage which I have discovered in this neighbourhood, ranged somewhat in the order in which they appear:

	Raii Nomina.	Appears about
1. Wryneck,	*Junx, sive torquilla.*	The middle of March: harsh note.
2. Smallest willow-wren,	*Regulus non cristatus.*	March 23: chirps till September.
3. Swallow,	*Hirundo domestica.*	April 13.
4. Martin,	*Hirundo rustica.*	Ditto.
5. Sand-martin,	*Hirundo riparia.*	Ditto.
6. Blackcap,	*Atricapilla.*	April 13: a sweet wild note.
7. Nightingale,	*Luscinia.*	Beginning of April.
8. Cuckoo,	*Cuculus.*	Middle of April.
9. Middle willow-wren,	*Regulus non cristatus.*	Ditto: a sweet plaintive note.
10. White-throat,	*Ficedula affinis.*	Ditto: mean note; sings on till September.
11. Red-start,	*Ruticilla.*	Ditto: more agreeable song.
12. Stone-curlew,	*Oedicnemus.*	End of March: loud nocturnal whistle.

A cottage in the lythe.

		RAII NOMINA.	APPEARS ABOUT.
13.	Turtle-dove,	*Turtur.*	
14.	Grasshopper-lark,	*Alauda minima locustæ voce.*	Middle of April: a small sibilous note, till the end of July.
15.	Swift,	*Hirundo apus.*	April 27.
16.	Less reed-sparrow,	*Passer arundinaceus minor.*	A sweet polyglot, but hurrying: it has the notes of many birds.
17.	Land-rail,	*Ortygometra.*	A loud harsh note, "crex, crex."
18.	Largest willow-wren,	*Regulus non cristatus.*	"Cantat voce stridulâ locustæ;" end of April; on the tops of high beeches.
19.	Goat-sucker, or Fern-owl,	*Caprimulgus.*	Beginning of May: chatters by night with a singular noise.
20.	Fly-catcher,	*Stoparola.*	May 12. A very mute bird. This is the latest summer bird of passage.

This assemblage of curious and amusing birds belongs to ten several genera of the Linnæan system; and are all of the *ordo* of *passeres*, save the *jynx* and

A family of land-rails.

cuculus, which are *picæ*, and the *charadrius* (*œdicnemus*) and *rallus* (*ortygometra*), which are *grallæ*.

These birds, as they stand numerically, belong to the following Linnæan genera:—

1.	*Jynx.*	13. *Columba.*
2, 6, 7, 9, 10, 11, 16, 18.	*Motacilla.*	17. *Rallus.*
3, 4, 5, 15.	*Hirundo.*	19. *Caprimulgus.*
8.	*Cuculus.*	14. *Alauda.*
12.	*Charadrius.*	20. *Muscicapa.*

Most soft-billed birds live on insects, and not on grain and seeds; and therefore at the end of summer they retire: but the following soft-billed birds, though insect-eaters, stay with us the year round:—

	RAII NOMINA.	
Redbreast,	*Rubecula.*	These frequent houses, and haunt outbuildings in the winter: eat spiders.
Wren,	*Passer troglodytes.*	
Hedge-sparrow,	*Curruca.*	Haunts sinks for crumbs and other sweepings.
White-wagtail,	*Motacilla alba.*	These frequent shallow rivulets near the spring heads, where they never freeze; eat the *aureliæ* of Phryganea. The smallest birds that walk.
Yellow-wagtail,	*Motacilla flava.*	
Grey-wagtail,	*Motacilla cinerea.*	
Wheat-ear,	*Oenanthe.*	Some of these are to be seen with us the winter through.
Whin-chat,	*Oenanthe secunda.*	
Stone-chatter,	*Oenanthe tertia.*	
Golden-crowned wren,	*Regulus cristatus.*	This is the smallest British bird: haunts the tops of tall trees: stays the winter through.

A List of the Winter Birds of Passage round this neighbourhood, ranged somewhat in the order in which they appear:—

1. Ring-ousel,	*Merula torquata.*	This is a new migration, which I have lately discovered about Michaelmas week, and again about the 14th of March.
2. Redwing,	*Turdus iliacus.*	About old Michaelmas.
3. Fieldfare,	*Turdus pilaris.*	Though a percher by day, roosts on the ground.
4. Royston-crow,	*Cornix cinerea.*	Most frequent on downs.
5. Woodcock,	*Scolopax.*	Appears about old Michaelmas.
6. Snipe,	*Gallinago minor.*	Some snipes constantly breed with us.
7. Jack-snipe,	*Gallinago minima.*	
8. Wood-pigeon,	*Oenas.*	Seldom appears till late: not in such plenty as formerly.
9. Wild-swan,	*Cygnus ferus.*	On some large waters.
10. Wild-goose,	*Anser ferus.*	
11. Wild-duck,	*Anas torquata minor.*	
12. Pochard,	*Anas fera fusca.*	
13. Widgeon,	*Penelope.*	
14. Teal, breeds with us in Wolmer Forest,	*Querquedula.*	On our lakes and streams.
15. Cross-beak,	*Coccothraustes.*	These are only wanderers that appear occasionally, and are not observant of any regular migration.
16. Cross-bill,	*Loxia.*	
17. Silk-tail,	*Garrulus bohemicus.*	

These birds, as they stand numerically, belong to the following Linnæan genera :—

1, 2, 3,	*Turdus.*	9, 10, 11, 12, 13, 14.	
4,	*Corvus.*		*Anas.*
5, 6, 7,	*Scolopax.*	15, 16,	*Loxia.*
8,	*Columba.*	17,	*Ampelis.*

Birds that sing in the night are but few :—

Nightingale,	*Luscinia.*	"In shadiest covert hid."—MILTON.

Woodlark,	*Alauda arborea.*	Suspended in mid air.
Less reed-sparrow,	*Passer arundinaceus minor.*	Among reeds and willows.

I should now proceed to such birds as continue to sing after Midsummer, but, as they are rather numerous, they would exceed the bounds of this paper; besides, as this is now the season for remarking on that subject, I am willing to repeat my observations on some birds concerning the continuation of whose song I seem at present to have some doubt.

SELBORNE, *June* 30, 1769.

[As one of my neighbours was traversing Wolmer Forest from Bramshot, across the moors, he found a large uncommon bird fluttering in the heath, but not wounded, which he brought home alive. On examination it proved to be *Colymbus glacialis*, Linn., the great speckled diver or loon, which is most excellently described in "Willughby's Ornithology."

Every part and proportion of this bird is so incomparably adapted to its mode of life, that in no instance do we see the wisdom of God in the creation to more advantage. The head is sharp, and smaller than the part of the neck adjoining, in order that it may pierce the water; the wings are placed forward and out of the centre of gravity, for a purpose which shall be noticed hereafter; the thighs quite at the podex, in order to facilitate diving; and the legs are flat, and as sharp backwards almost as the edge of a

knife, that in striking they may easily cut the water: while the feet are palmated, and broad for swimming, yet so folded up when advanced forward to take a fresh stroke, as to be full as narrow as the shank. The two exterior toes of the feet are longest; the nails flat and broad, resembling the human, which give strength and increase the power of swimming. The foot, when expanded, is not at right angles to the leg or body of the bird; but the exterior part inclining towards the head forms an acute angle with the body; the intention being not to give motion in the line of the legs themselves, but by the combined impulse of both in an intermediate line—the line of the body.

Most people know, that have observed at all, that the swimming of birds is nothing more than a walking in the water, where one foot succeeds the other as on the land; yet no one, as far as I am aware, has remarked that diving fowls, while under water, impel and row themselves forward by a motion of their wings, as well as by the impulse of their feet: but such is really the case, as any person may easily be convinced, who will observe ducks when hunted by dogs in a clear pond. Nor do I know that any one has given a reason why the wings of diving fowls are placed so forward: doubtless, not for the purpose of promoting their speed in flying, since that position certainly impedes it; but probably for the increase of their motion under water, by the use of four oars

instead of two; yet, were the wings and feet nearer together, as in land-birds, they would, when in action, rather hinder than assist one another.

This *colymbus* was of considerable bulk, weighing only three drachms short of three pounds avoirdupois. It measured in length from the bill to the tail (which was very short) two feet, and to the extremities of the toes four inches more; and the breadth of the wings expanded was forty-two inches. A person attempted to eat the body, but found it very strong and rancid, as is the flesh of all birds living on fish. Divers or loons, though bred in the most northerly parts of Europe, yet are seen with us in very severe winters; and on the Thames are called sprat loons, because they prey much on that sort of fish.

The legs of the *colymbi* and *mergi* are placed so very backward and so out of all centre of gravity, that these birds cannot walk at all. They are called by Linnæus *compedes*, because they move on the ground as if shackled or fettered.

A man brought me a landrail or daker-hen, a bird so rare in this district that we seldom see more than one or two in a season, and those only in autumn. This is deemed a bird of passage by all the writers: yet from its formation seems to be poorly qualified for migration; for its wings are short, and placed so forward and out of the centre of gravity, that it flies in a very heavy and embarrassed manner, with its legs hanging down; and can hardly be sprung a sec-

ond time, as it runs very fast, and seems to depend more on the swiftness of its feet than on its flying.

When we came to draw it, we found the entrails so soft and tender, that in appearance they might have been dressed like the ropes of a woodcock. The craw or crop was small and lank, containing a mucus; the gizzard thick and strong, and filled with small shell-snails, some whole, and many ground to pieces through the attrition which is occasioned by the muscular force and motion of that intestine. We saw no gravels among the food; perhaps the shell-snails might perform the functions of gravels or pebbles, and might grind one another. Landrails used to abound formerly, I remember, in the low wet bean-fields of Christian Malford in North Wilts, and in the meadows near Paradise Gardens at Oxford, where I have often heard them cry "crex, crex." The bird mentioned above weighed $7\frac{1}{2}$ oz., was fat and tender, and in flavour like the flesh of a woodcock. The liver was very large and delicate.]—OBSERVATIONS ON NATURE.

LETTER XXVI.

TO THOMAS PENNANT, ESQ.

IT gives me satisfaction to find that my account of the ousel migration pleases you. You put a very

shrewd question when you ask me how I know that their autumnal migration is southward? Was not candour and openness the very life of natural history, I should pass over this query just as a sly commentator does over a crabbed passage in a classic; but common ingenuousness obliges me to confess, not without some degree of shame, that I only reasoned in that case from analogy. For as all other autumnal birds migrate from the northward to us, to partake of our milder winters, and return to the northward again when the rigorous cold abates, so I concluded that the ring-ousels did the same, as well as their congeners the fieldfares; and especially as ring-ousels are known to haunt cold mountainous countries: but I have good reason to suspect since that they may come to us from the westward; because I hear, from very good authority, that they breed on Dartmoor, and that they forsake that wild district about the time that our visitors appear, and do not return till late in the spring.

I have taken a great deal of pains about your *salicaria* and mine, with a white stroke over its eye and a tawny rump. I have surveyed it alive and dead, and have procured several specimens; and am perfectly persuaded myself (and trust you will soon be convinced of the same) that it is neither more nor less than the *Passer arundinaceus minor* of Ray. This bird, by some means or other, seems to be entirely omitted in the "British Zoology;" and one

reason probably was, because it is so strangely classed in Ray, who ranges it among his *Pici affines*. It ought no doubt to have gone among his small birds with the tail of one colour (*Aviculæ caudâ unicolore*), and among your slender-billed birds of the same division. Linnæus might, with great propriety, have put it into his genus of *motacilla*, and the *Motacilla salicaria* of his "Fauna Suecica" seems to come the nearest to it. It is no uncommon bird, haunting the sides of ponds and rivers where there is covert, and the reeds and sedges of moors. The country people in some places call it the sedge-bird. It sings incessantly night and day during the breeding time, imitating the note of a sparrow, a swallow, a skylark, and has a strange hurrying manner in its song. My specimens correspond most minutely to the description of your fen-*salicaria* shot near Revesby. Mr. Ray has given an excellent characteristic of it when he says,—"*Rostrum et pedes in hâc aviculâ multô majores sunt quam pro corporis ratione.*" "The beak and feet of this little bird are much too large for its body."

I have got you the egg of an *oedicnemus*, or stone-curlew, which was picked up in a fallow on the naked ground: there were two; but the finder inadvertently crushed one with his foot before he saw them.

When I wrote to you last year on reptiles, I wish I had not forgot to mention the faculty that snakes

have of stinking to defend themselves, *se defendendo*. I knew a gentleman who kept a tame snake, which

Among the hedgerows.

was in its person as sweet as any animal while in good humour and unalarmed ; but as soon as a stranger, or a dog or cat, came in, it fell to hissing, and filled the room with such nauseous effluvia as rendered it hardly supportable. Thus the skunck, or stonck, of Ray's Synop. Quadr., is an innocuous and

sweet animal; but, when pressed hard by dogs and men, it can eject such a most pestilent and fetid smell and excrement, than which nothing can be more horrible.

A gentleman sent me lately a fine specimen of the *Lanius minor cinerascens cum maculâ in scapulis alba Raii;* which is a bird that, at the time of your publishing your first two volumes of British Zoology, I find you had not seen. You have described it well from Edwards's drawing.

SELBORNE, *Aug.* 30, 1769.

LETTER XXVII.

TO THE HONOURABLE DAINES BARRINGTON.

WHEN I did myself the honour to write to you about the end of last June on the subject of natural history, I sent you a list of the summer birds of passage which I have observed in this neighbourhood; and also a list of the winter birds of passage: I mentioned besides those soft-billed birds that stay with us the winter through in the south of England, and those that are remarkable for singing in the night.

According to my proposal, I shall now proceed to such birds (singing birds strictly so called) as

continue in full song till after Midsummer; and shall range them somewhat in the order in which they first begin to open as the spring advances.

	RAII NOMINA.	
1. Woodlark,	*Alauda arborea.*	In January, and continues to sing through all the summer and autumn.
2. Song-thrush,	*Turdus simpliciter dictus.*	In February and on to August, reassume their song in autumn.
3. Wren,	*Passer troglodytes.*	All the year, hard frost excepted.
4. Redbreast,	*Rubecula.*	Ditto.
5. Hedge-sparrow,	*Curruca.*	Early in February to July the 10th.
6. Yellow-hammer,	*Emberiza flava.*	Early in February, and on through July to August the 21st.
7. Skylark,	*Alauda vulgaris.*	In February, and on to October.
8. Swallow,	*Hirundo domestica.*	From April to September.
9. Blackcap,	*Atricapilla.*	Beginning of April to July the 13th.
10. Titlark,	*Alauda pratorum.*	From middle of April to July the 16th.
11. Blackbird,	*Merula vulgaris.*	Sometimes in February and March, and so on to July the 23rd; reassumes in autumn.
12. White-throat,	*Ficedula affinis.*	In April, and on to July the 23rd.
13. Goldfinch,	*Carduelis.*	April, and through to September the 16th.
14. Greenfinch,	*Chloris.*	On to July and August the 2nd.
15. Less reed-sparrow,	*Passer arundinaceus minor.*	May, on to beginning of July.
16. Common linnet,	*Linaria vulgaris.*	Breeds and whistles on till August; reassumes its note when they begin to congregate in October, and again early before the flocks separate.

Birds that cease to be in full song, and are usually silent at or before midsummer:—

	RAII NOMINA.	
17. Middle willow-wren,	*Regulus non cristatus.*	Middle of June: begins in April.
18. Redstart,	*Ruticilla.*	Ditto: begins in May.
19. Chaffinch,	*Fringilla.*	Beginning of June: sings first in February.
20. Nightingale,	*Luscinia.*	Middle of June: sings first in April.

Birds that sing for a short time, and very early in the spring:—

21. Missel-bird,	*Turdus viscivorus.*	January the 2nd, 1770, in February. Is called in Hampshire and Sussex the storm-cock, because its song is supposed to forbode windy, wet weather: is the largest singing bird we have.
22. Great Titmouse, or Ox-eye,	*Fringillago.*	In February, March, April: reassumes for a short time in September.

Birds that have somewhat of a note or song, and yet are hardly to be called singing birds:—

23. Golden-crowned wren,	*Regulus cristatus.*	Its note as minute as its person: frequents the tops of high oaks and firs: the smallest British bird.
24. Marsh-titmouse,	*Parus palustris.*	Haunts great woods: two harsh, sharp notes.
25. Small willow-wren.	*Regulus non cristatus.*	Sings in March, and on to September.
26. Largest ditto,	*Ditto.*	"Cantat voce stridulâ locustæ;" from end of April to August.
27. Grasshopper-lark,	*Alauda minima voce locustæ.*	Chirps all night, from the middle of April to the end of July.

28. Martin,	*Hirundo agrestis.*	All the breeding time; from May to September.
29. Bullfinch,	*Pyrrhula.*	
30. Bunting,	*Emberiza alba.*	From the end of January to July.

All singing birds, and those that have any pretensions to song, not only in Britain, but perhaps the world through, come under the Linnæan *ordo* of *passeres*.

The above-mentioned birds, as they stand numerically, belong to the following Linnæan genera:—

1, 7, 10, 27.	*Alauda.*	8, 28.	*Hirundo.*
2, 11, 21.	*Turdus.*	13, 16, 19.	*Fringilla.*
3, 4, 5, 9, 12, 15, 17, 18, 20, 23, 25, 26.	*Motacilla.*	22, 24.	*Parus.*
6, 30.	*Emberiza.*	14, 29.	*Loxia.*

Birds that sing as they fly are but few:—

	RAII NOMINA.	
Skylark,	*Alauda vulgaris.*	Rising, suspended, and falling.
Titlark,	*Alauda pratorum.*	In its descent; also sitting on trees, and walking on the ground.
Woodlark,	*Alauda arborea.*	Suspended; in hot summer nights all night long.
Blackbird,	*Merula.*	Sometimes from bush to bush.
White-throat,	*Ficedula affinis.*	Uses when singing on the wing odd jerks and gesticulations.
Swallow,	*Hirundo domestica.*	In soft sunny weather.
Wren,	*Passer troglodytes.*	Sometimes from bush to bush.

Birds that breed most early in these parts:—

Raven,	*Corvus.*	Hatches in February and March.
Song-thrush,	*Turdus.*	In March.
Blackbird,	*Merula.*	Ditto.

Rook,	*Cornix frugilega.*	Builds the beginning of March.
Woodlark,	*Alauda arborea.*	Hatches in April.
Ring-dove,	*Palumbus torquatus.*	Lays the beginning of April.

All birds that continue in full song till after Midsummer appear to me to breed more than once.

Most kinds of birds seem to me to be wild and shy somewhat in proportion to their bulk; I mean in this island, where they are much pursued and annoyed: but in Ascension Island, and many other desolate places, mariners have found fowls so unacquainted with a human figure, that they would stand still to be taken; as is the case with boobies, &c. As an example of what is advanced, I remark that the golden-crested wren (the smallest British bird) will stand unconcerned until you come within three or four yards of it, while the bustard (*otis*), the largest British land fowl, does not care to admit a person within so many furlongs.

Golden-crested wrens.

SELBORNE, *Nov.* 2, 1769.

LETTER XXVIII.

To Thomas Pennant, Esq.

I was much gratified by your communicative letter on your return from Scotland, where you spent, I find, some considerable time, and gave yourself good room to examine the natural curiosities of that extensive kingdom, both those of the islands, as well as those of the highlands. The usual bane of such expeditions is hurry; because men seldom allot themselves half the time they should do: but, fixing on a day for their return, post from place to place, rather as if they were on a journey that required despatch, than as philosophers investigating the works of nature. You must have made, no doubt, many discoveries, and laid up a good fund of materials for a future edition of the British Zoology; and will have no reason to repent that you have bestowed so much pains on a part of Great Britain that perhaps was never so well examined before.

It has always been matter of wonder to me that fieldfares, which are so congenerous to thrushes and blackbirds, should never choose to breed in England: but that they should not think even the highlands cold and northerly, and sequestered enough, is a circumstance still more strange and wonderful. The ring-ousel, you find, stays in Scotland the whole year round; so that we have reason to conclude that those

migrators that visit us for a short space every autumn do not come from thence.

And here, I think, will be the proper place to mention that those birds were most punctual again in their migration this autumn, appearing, as before, about the thirtieth of September: but their flocks were larger than common, and their stay protracted somewhat beyond the usual time. If they came to spend the whole winter with us, as some of their congeners do, and then left us, as they do, in spring, I should not be so much struck with the occurrence, since it would be similar to that of the other winter birds of passage; but when I see them for a fortnight at Michaelmas, and again for about a week in the beginning of April, I am seized with wonder, and long to be informed whence these travellers come, and whither they go, since they seem to use our hills merely as an inn or baiting-place.

Your account of the greater brambling, or snow-flock, is very amusing; and strange it is that such a short-winged bird should delight in such perilous voyages over the northern ocean! Some country people in the winter time have every now and then told me that they have seen two or three white larks on our downs; but, on considering the matter, I begin to suspect that these are some stragglers of the birds we are talking of, which sometimes perhaps may rove so far to the southward.

It pleases me to find that white hares are so fre-

quent on the Scottish mountains, and especially as you inform me that it is a distinct species, for the quadrupeds of Britain are so few, that every new species is a great acquisition.

The eagle-owl, could it be proved to belong to us, is so majestic a bird that it would grace our *fauna* much. I never was informed before where wild geese are known to breed.

You admit, I find, that I have proved your fen-*salicaria* to be the lesser reed-sparrow of Ray: and I think you may be secure that I am right; for I took very particular pains to clear up that matter, and had some fair specimens; but, as they were not well preserved, they are decayed already. You will, no doubt, insert it in its proper place in your next edition. Your additional plates will much improve your work.

De Buffon, I know, has described the water shrew-mouse; but still I am pleased to find you have discovered it in Lincolnshire, for the reason I have given in the article of the white hare.

As a neighbour was lately ploughing in a dry chalky field, far removed from any water, he turned out a water-rat, that was curiously laid up in an hybernaculum artificially formed of grass and leaves. At one end of the burrow lay about a gallon of potatoes regularly stowed, on which it was to have supported itself for the winter. But the difficulty with me is how this *amphibius mus* came to fix its win-

ter station at such a distance from the water. Was it determined in its choice of that place by the mere accident of finding the potatoes which were planted there? or is it the practice of the aquatic rat to forsake the neighbourhood of the water in the colder months?

Though I delight very little in analogous reasoning, knowing how fallacious it is with respect to natural history; yet, in the following instance, I cannot help being inclined to think it may conduce towards the explanation of a difficulty that I have mentioned before, with respect to the invariable early retreat of the *Hirundo apus*, or swift, so many weeks before its congeners; and that not only with us, but also in Andalusia, where they also begin to retire about the beginning of August.

The great large bat* (which by the way is at present a nondescript in England, and what I have never been able yet to procure) retires or migrates very early in the summer: it also ranges very high for its food, feeding in a different region of the air; and that is the reason I never could procure one. Now this is exactly the case with the swifts, for they take their food in a more exalted region than the other species, and are very seldom seen hawking for flies near the ground, or over the surface of the

* The little Bat appears almost every month in the year; but I have never seen the large one till the end of April, nor after July. They are most common in June, but never very plentiful.

water. From hence I would conclude that these *hirundines*, and the larger bats, are supported by some sorts of high-flying gnats, scarabs, or *phalænæ* that are short of continuance; and that the short stay of these strangers is regulated by the defect of their food.

By my journal it appears that curlews clamoured on to October the 31st; since which I have not seen or heard any. Swallows were observed on to November the third.

SELBORNE, *Dec.* 8, 1769.

LETTER XXIX.

TO THE HONOURABLE DAINES BARRINGTON.

IT was no small matter of satisfaction to me to find that you were not displeased with my little *methodus* of birds. If there is any merit in the sketch, it must be in its exactness. For many months I carried a list in my pocket of the birds that were to be remarked on; and, as I rode or walked about, I noted each day the continuance or omission of each bird's song; so that I am as sure of my facts as a man can be of any transaction whatsoever.

I shall now proceed to answer the several queries which you put in your two obliging letters, in the best manner that I am able. Perhaps Eastwick, and

its environs, where you heard so very few birds, is not a woodland country, and therefore not stocked with such songsters. If you will cast your eye on my last letter, you will find that many species continued to warble after the beginning of July.

The titlark and yellowhammer breed late, the latter very late; and therefore it is no wonder that they protract their song: for I lay it down as a maxim in ornithology, that as long as there is any incubation going on there is music. As to the redbreast and wren, it is well known to the most incurious observer that they whistle the year round, hard frost excepted; especially the latter.

It was not in my power to procure you a blackcap, or a lesser reed-sparrow, or sedge-bird, alive. As the first is undoubtedly, and the last, as far as I can yet see, a summer bird of passage, they would require more nice and curious management in a cage than I should be able to give them: they are both distinguished songsters. The note of the blackcap has such a wild sweetness that it always brings to my mind those lines in a song in *As You Like It*,—

> "And tune his merry note
> Unto the *wild* bird's throat."
>
> SHAKESPEARE.

The sedge-bird has a surprising variety of notes resembling the song of several other birds; but then it has also a hurrying manner, not at all to its advantage: it is notwithstanding a delicate polyglot.

It is new to me that titlarks in cages sing in the night; perhaps only caged birds do so. I once knew a tame redbreast in a cage that always sang as long as candles were in the room; but in their wild state no one supposes they sing in the night.

I should be almost ready to doubt the fact, that there are to be seen much fewer birds in July than in any former month, notwithstanding so many young are hatched daily. Sure I am that it is far otherwise with respect to the swallow tribes, which increase prodigiously as the summer advances. I saw, at the time mentioned, many hundreds of young wagtails on the banks of the Cherwell, which almost covered the meadows. If the matter appears as you say in the other species, may it not be owing to the dams being engaged in incubation, while the young are concealed by the leaves?

Many times have I had the curiosity to open the stomach of woodcocks and snipes; but nothing ever occurred that helped to explain to me what their subsistence might be: all that I could ever find was a soft mucus, among which lay many pellucid small gravels.

SELBORNE, *Jan.* 15, 1770.

LETTER XXX.

To the Honourable Daines Barrington.

Your observation that "the cuckoo does not deposit its egg indiscriminately in the nest of the first bird that comes in its way, but probably looks out a nurse in some degree congenerous, with whom to intrust its young," is perfectly new to me; and struck me so forcibly, that I naturally fell into a train of thought that led me to consider whether the fact was so, and what reason there was for it. When I came to recollect and inquire, I could not find that any cuckoo had ever been seen in these parts, except in the nest of the wagtail, the hedge-sparrow, the titlark, the whitethroat, and the redbreast, all soft-billed insectivorous birds. The excellent Mr. Willughby mentions the nest of the *palumbus* (ring-dove) and of the *fringilla* (chaffinch), birds that subsist on acorns and grains, and such hard food: but then he does not mention them as of his own knowledge, but says afterwards

The cuckoo.

that he saw himself a wagtail feeding a cuckoo. It appears hardly possible that a soft-billed bird should subsist on the same food with the hard-billed; for the former have thin membranaceous stomachs suited to their soft food, while the latter, the granivorous tribe, have strong muscular gizzards, which, like mills, grind, by the help of small gravels and pebbles, what is swallowed. This proceeding of the cuckoo, of dropping its eggs as it were by chance, is such a monstrous outrage on maternal affection, one of the first great dictates of nature, and such a violence on instinct, that, had it only been related of a bird in the Brazils, or Peru, it would never have merited our belief. But yet, should it farther appear that this simple bird, when divested of that natural στοργή that seems to raise the kind in general above themselves, and inspire them with extraordinary degrees of cunning and address, may be still endued with a more enlarged faculty of discerning what species are suitable and congenerous nursing mothers for its disregarded eggs and young, and may deposit them only under their care, this would be adding wonder to wonder, and instancing, in a fresh manner, that the methods of Providence are not subjected to any mode or rule, but astonish us in new lights, and in various and changeable appearances.

What was said by a very ancient and sublime writer concerning the defect of natural affection in

the ostrich may be well applied to the bird we are talking of:—

"*She is hardened against her young ones, as though they were not hers:*

"*Because God hath deprived her of wisdom, neither hath He imparted to her understanding.*" (Job xxxix. 16, 17.)

Does each female cuckoo lay but one egg in a season, or does she drop several in different nests, according as opportunity offers?

SELBORNE, *Feb.* 19, 1770.

LETTER XXXI.

TO THOMAS PENNANT, ESQ.

HEDGE-HOGS abound in my gardens and fields. The manner in which they eat the roots of the plantain in the grass-walk is very curious: with their upper mandible, which is much longer than their lower, they bore under the plant, and so eat the root off upwards, leaving the tuft of leaves untouched. In this respect they are serviceable, as they destroy a very troublesome weed; but they deface the walks in some measure by digging little round holes. It appears, by the dung that they drop upon the turf, that beetles are no inconsiderable part of their food. In June last I procured a litter of five or

six young hedgehogs, which appeared to be about five or six days old; they, I find, like puppies, are born blind, and could not see when they came to my hands. No doubt their spines are soft and flexible at the time of their birth, or else the poor dam would have but a bad time of it in the critical moment of parturition: but it is plain that they soon harden; for these little pigs have such stiff prickles on their backs and sides as would easily have fetched blood, had they not been handled with caution. Their spines are quite white at this age; and they have little hanging ears, which I do not remember to be discernible in the old ones. They can, in part, at this age draw their skin down over their faces; but are not able to contract themselves into a ball, as they do, for the sake of defence, when full grown. The reason, I suppose, is because the curious muscle that enables the creature to roll itself up in a ball was not then arrived at its full tone and firmness. Hedge-hogs make a deep and warm hybernaculum with leaves and moss, in which they conceal themselves for the winter: but I never could find that they stored in any winter provision, as some quadrupeds certainly do.

A hedgehog.

I have discovered an anecdote with respect to the fieldfare (*Turdus pilaris*), which I think is particular enough: this bird, though it sits on trees in the daytime, and procures the greatest part of its food from whitethorn hedges; yea, moreover, builds on very high trees, as may be seen by the "Fauna Suecica," yet always appears with us to roost on the ground. They are seen to come in flocks just before it is dark, and to settle and nestle among the heath on our forest. And besides, the larkers, in dragging their nets by night, frequently catch them in the wheat stubbles; while the bat-fowlers, who take many redwings in the hedges, never entangle any of this species. Why these birds, in the matter of roosting, should differ from all their congeners, and from themselves also with respect to their proceedings by day, is a fact for which I am by no means able to account.

I have somewhat to inform you of concerning the moose-deer; but in general foreign animals fall seldom in my way; my little intelligence is confined to the narrow sphere of my own observations at home.

SELBORNE, *Feb.* 22, 1770.

LETTER XXXII.

To Thomas Pennant, Esq.

On Michaelmas-day, 1768, I managed to get a sight of the female moose belonging to the Duke of Richmond, at Goodwood; but was greatly disappointed, when I arrived at the spot, to find that it died, after having appeared in a languishing way for some time, on the morning before. However, understanding that it was not stripped, I proceeded to examine this rare quadruped: I found it in an old green-house, slung under the belly and chin by ropes, and in a standing posture; but, though it had been dead for so short a time, it was in so putrid a state that the stench was hardly supportable. The grand distinction between this deer, and any other species that I have ever met with, consisted in the strange length of its legs; on which it was tilted up much in the manner of the birds of the *grallæ* order. I measured it, as they do an horse, and found that, from the ground to the wither, it was just five feet four inches, which height answers exactly to sixteen hands, a growth that few horses arrive at: but then, with this length of legs, its neck was remarkably short, no more than twelve inches; so that, by straddling with one foot forward and the other backward, it grazed on the plain ground, with the greatest difficulty, between its legs: the ears were vast and lop-

ping, and as long as the neck; the head was about twenty inches long, and ass-like; and had such a redundancy of upper lip as I never saw before, with huge nostrils. This lip, travellers say, is esteemed a dainty dish in North America. It is very reasonable to suppose that this creature supports itself chiefly by browsing of trees, and by wading after water plants; towards which way of livelihood the length of legs and great lip must contribute much. I have read somewhere that it delights in eating the *nymphæa*, or water-lily. From the fore-feet to the belly behind the shoulder it measured three feet and eight inches: the length of the legs before and behind consisted a great deal in the *tibia*, which was strangely long; but, in my haste to get out of the stench, I forgot to measure that joint exactly. Its scut seemed to be about an inch long; the colour was a grizzly black; the mane about four inches long; the forehoofs were upright and shapely, the hind flat and splayed. The spring before, it was only two years old, so that most probably it was not then come to its growth. What a vast tall beast must a full-grown stag be! I have been told that some arrive at ten feet and a half! This poor creature had at first a female companion of the same species, which died the spring before. In the same garden was a young stag, or red deer, between whom and this moose it was hoped that there might have been a breed; but their inequality of height must always be a bar. I should

have been glad to have examined the teeth, tongue, lips, hoofs, &c., minutely; but the putrefaction precluded all further curiosity. This animal, the keeper told me, seemed to enjoy itself best in the extreme frost of the former winter. In the house they showed me the horn of a male moose, which had no front-antlers, but only a broad palm with some snags on the edge. The noble owner of the dead moose proposed to make a skeleton of her bones.

Please to let me hear if my female moose corresponds with that you saw; and whether you think still that the American moose and European elk are the same creature.

SELBORNE, *March*, 1770.

LETTER XXXIII.

TO THE HONOURABLE DAINES BARRINGTON.

I HEARD many birds of several species sing last year after Midsummer; enough to prove that the summer solstice is not the period that puts a stop to the music of the woods. The yellow-hammer, no doubt, persists with more steadiness than any other; but the woodlark, the wren, the redbreast, the swallow, the white-throat, the goldfinch, the common linnet, are all undoubted instances of the truth of what I advance.

If this severe season does not interrupt the regularity of the summer migrations, the blackcap will be here in two or three days. I wish it was in my power to procure you one of those songsters; but I am no bird-catcher; and so little used to birds in a cage, that I fear if I had one it would soon die for want of skill in feeding.

Song thrushes.

Was your reed-sparrow, which you kept in a cage, the thick-billed reed-sparrow of the "Zoology," p. 30; or was it the less reed-sparrow of Ray, the sedge-bird of Mr. Pennant's "Zoology," p. 16?

As to the matter of long-billed birds growing fatter in moderate frost, I have doubt within myself what should be the reason. The thriving at those times appears to me to arise altogether from the gentle check which the cold throws upon insensible perspiration. The case is just the same with blackbirds, &c.; and farmers and warreners observe, the

first, that their hogs fatten more kindly at such times, and the latter, that their rabbits are never in such good case as in a gentle frost. But when frosts are severe, and of long continuance, the case is soon altered; for then a want of food soon overbalances the repletion occasioned by a checked perspiration. I have observed, moreover, that some human constitutions are more inclined to plumpness in winter than in summer.

When birds come to suffer by severe frost, I find that the first that fail and die are the redwing, fieldfares, and then the song-thrushes.

You wonder, with good reason, that the hedge-sparrows, &c. can be induced at all to sit on the egg of the cuckoo without being scandalized at the vastly disproportioned size of the supposititious egg; but the brute creation, I suppose, have very little idea of size, colour, or number. For the common hen, as I know, when the fury of incubation is on her, will sit on a single shapeless stone instead of a nest full of eggs that have been withdrawn: and, moreover, a hen-turkey, in the same circumstances, would sit on in the empty nest till she perished with hunger.

I think the matter might easily be determined whether a cuckoo lays one or two eggs, or more, in a season, by opening a female during the laying-time. If more than one was come down out of the ovary, and advanced to a good size, doubtless then she

would that spring lay more than one. I will endeavour to get a hen, and examine her.

Your supposition that there may be some natural obstruction in singing birds while they are mute, and that when this is removed the song recommences, is new and bold: I wish you could discover some good grounds for this suspicion.

I was glad you were pleased with my specimen of the *caprimulgus*, or fern-owl; you were, I find, acquainted with the bird before.

When we meet, I shall be glad to have some conversation with you concerning the proposal you make of my drawing up an account of the animals in this neighbourhood. Your partiality towards my small abilities persuades you, I fear, that I am able to do more than is in my power: for it is no small undertaking for a man unsupported and alone to begin a natural history from his own autopsia! Though there is endless room for observation in the field of nature, which is boundless, yet investigation (where a man endeavours to be sure of his facts) can make but slow progress; and all that one could collect in many years would go into a very narrow compass.

Some extracts from your ingenious "Investigations of the difference between the present temperature of the air in Italy," &c. have fallen in my way; and gave me great satisfaction; they have removed the objections that always arose in my mind when-

ever I came to the passages which you quote. Surely the judicious Virgil, when writing a didactic poem for the region of Italy, could never think of describing freezing rivers, unless such severity of weather pretty frequently occurred!

Two swallows have appeared amidst snows and frost.

SELBORNE, *April* 12, 1770.

LETTER XXXIV.

TO THOMAS PENNANT, ESQ.

LAST month we had such a series of cold turbulent weather, such a constant succession of frost, and snow, and hail, and tempest, that the regular migration or appearance of the summer birds was much interrupted. Some, as the blackcap and whitethroat, did not show themselves (at least were not heard) till weeks after their usual time; and some, as the grasshopper-lark and largest willow-wren, have not been heard yet. As to the fly-catcher, I have not seen it; it is indeed one of the latest, but should appear about this time: and yet, amidst all this meteorous strife and war of the elements, two swallows discovered themselves as long ago as the 11th of April, in frost and snow; but they withdrew quickly and were not visible again for many days. House-

The backdoor walk to a cottage garden.

martins, which are always more backward than swallows, were not observed till May came in.

Among the monogamous birds several are to be found single after pairing-time, and of each sex: but whether this state of celibacy is matter of choice or necessity, is not so easily discoverable. When the house-sparrows deprive my martins of their nests, as soon as I cause one to be shot, the other, be it cock or hen, presently procures a mate, and so for several times following.

I have known a dove-house infested by a pair of white owls, which made great havoc among the young pigeons: one of the owls was shot as soon as possible; but the survivor readily found a mate, and the mischief went on. After some time the new pair were both destroyed, and the annoyance ceased.

Another instance I remember of a sportsman, whose zeal for the increase of his game being greater than his humanity, after paring-time he always shot the cock-bird of every couple of partridges upon his grounds; supposing that the rivalry of many males interrupted the breed: he used to say, that, though he had widowed the same hen several times, yet he found that she was still provided with a fresh paramour, that did not take her away from her usual haunt.

Again: I knew a lover of setting, an old sportsman, who has often told me that soon after harvest he has frequently taken small coveys of partridges,

consisting of cock-birds alone; these he pleasantly used to call old bachelors.

There is a propensity belonging to common house-cats that is very remarkable; I mean their violent fondness for fish, which appears to be their most favourite food: and yet nature in this instance seems to have planted in them an appetite that, unassisted, they know not how to gratify: for of all quadrupeds cats are the least disposed towards water; and will not, when they can avoid it, deign to wet a foot, much less to plunge into that element.

Quadrupeds that prey on fish are amphibious: such is the otter, which by nature is so well formed for diving, that it makes great havoc among the inhabitants of the waters. Not supposing that we had any of those beasts in our shallow brooks, I was much pleased to see a male otter brought to me, weighing twenty-one pounds, that had been shot on the bank of our stream below the Priory, where the rivulet divides the parish of Selborne from Harteley-wood.

[One of my neighbours shot a ring-dove on an evening as it was returning from feed and going to roost. When his wife had picked and drawn it, she found its craw stuffed with the most nice and tender tops of turnips. These she washed and boiled, and so sat down to a choice and delicate plate of greens, culled and provided in this extraordinary manner.

Hence we may see that graminivorous birds,

when grain fails, can subsist on the leaves of vegetables. There is reason to suppose that they would not long be healthy without, for turkeys, though corn-fed, delight in a variety of plants, such as cabbage, lettuce, endive, &c., and poultry pick much grass; while geese live for months together on commons by grazing alone.

> "Nought is useless made; — — —
> — — — — On the barren heath
> The shepherd tends his flock that daily crop
> Their verdant dinner from the mossy turf
> Sufficient: after them the cackling goose,
> Close-grazer, finds wherewith to ease her want."
> PHILIPPS'S *Cyder*.]

—OBSERVATIONS ON NATURE.

SELBORNE, *May* 12, 1770.

LETTER XXXV.

TO THE HONOURABLE DAINES BARRINGTON.

THE severity and turbulence of last month so interrupted the regular process of summer migration, that some of the birds do but just begin to show themselves, and others, as the whitethroat, the blackcap, the redstart, the fly-catcher, are apparently thinner than usual. I well remember that after the very severe spring in the year 1739–40, summer birds of passage were very scarce. They come hither proba-

bly with a south-east wind, or when it blows between those points; but in that unfavourable year the winds blowed the whole spring and summer through from the opposite quarters. And yet amidst all these disadvantages, two swallows, as I mentioned in my last, appeared this year as early as the eleventh of April, amidst frost and snow; but they withdrew again for a time.

I am not pleased to find that some people seem so little satisfied with Scopoli's new publication, "Annus Primus Historico-Naturalis." There is room to expect great things from the hands of that man, who is a good naturalist: and one would think that an history of the birds of so distant and southern a region as Carniola would be new and interesting. I could wish to see the work, and hope to get it sent down. Dr. Scopoli is physician to the wretches that work in the quicksilver mines of that district.

When you talked of keeping a reed-sparrow, and giving it seeds, I could not help wondering; because the reed-sparrow which I mentioned to you (*Passer arundinaceus minor* Raii)* is a soft-billed bird, and most probably migrates hence before winter; whereas the bird you kept (*Passer torquatus* Raii)† abides all the year, and is a thick-billed bird. I question whether the latter be much of a songster; but in this matter I want to be better informed. The

* Sedge-warbler, *Salicaria phragmitis*, Selby.

† Reed-bunting, *Emberiza schœniclus*, Linn.

former has a variety of hurrying notes, and sings all night. Some part of the song of the former, I suspect, is attributed to the latter. We have plenty of the soft-billed sort, which Mr. Pennant had entirely left out of his "British Zoology," till I reminded him of his omission.*

I have somewhat to advance on the different manners in which different birds fly and walk; but as this is a subject that I have not enough considered, and is of such a nature as not to be contained in a small space, I shall say nothing further about it at present.†

No doubt the reason why the sex of birds in their first plumage is so difficult to be distinguished is, as you say, "because they are not to pair and discharge their parental functions till the ensuing spring." As colours seem to be the chief external sexual distinction in many birds, these colours do not take place till sexual attachments commence. The case is the same with quadrupeds, among whom, in their younger days, the sexes differ but little; but, as they advance to maturity, horns and shaggy manes, beards and brawny necks, &c., strongly discriminate the male from the female. We may instance still further in our own species, where a beard and stronger features are usually characteristic of the male sex; but this sexual diversity does not take place in earlier

* See Letter XXVI., to Mr. Pennant, August 30, 1769.

† See Letter LXXXIV., to Mr. Barrington, August 7, 1778.

life, for a beautiful youth shall be so like a beautiful girl that the difference shall not be discernible :—

"Quem si puellarum insereres choro,
Mirè sagaces falleret hospites
Discrimen obscurum, solutis
Crinibus, ambiguoque vultu."
HOR. (II. v. 21–24.)

"A fellow who, if you put him among a parcel of girls, the difficulty of distinguishing him from them would puzzle a very quick-sighted host, thanks to his long hairs and smooth ambiguous face."

SELBORNE, *May* 21, 1770.

LETTER XXXVI.

TO THOMAS PENNANT, ESQ.

THE French, I think, in general are strangely prolix in their natural history. What Linnæus says with respect to insects holds good in every other branch: "Verbositas præsentis sæculi, calamitas artis." "The verbosity of the present generation is the calamity of art.'

Pray how do you approve of Scopoli's new work? as I admire his "Entomologia," I long to see it.

I forgot to mention in my last letter (and had not room to insert it in the former) that the male moose, in rutting time, swims from island to island, in the lakes and rivers of North America, in pursuit of the females. My friend, the chaplain, saw one killed in the water as it was on that errand in the river St.

Lawrence; it was a monstrous beast, he told me; but he did not take the dimensions.

When I was last in town our friend Mr. Barrington most obligingly carried me to see many curious sights. As you were then writing to him about horns, he carried me to see many strange and wonderful specimens. There is, I remember, at Lord Pembroke's, at Wilton, an horn-room furnished with more than thirty different pairs; but I have not seen that house lately.

Mr. Barrington showed me many astonishing collections of stuffed and living birds from all quarters of the world. After I had studied over the latter for a time, I remarked that every species almost that came from distant regions, such as South America, the coast of Guinea, &c., were thick-billed birds of the *loxia* and *fringilla* genera; and no *motacillæ* or *muscicapæ* were to be met with. When I came to consider, the reason was obvious enough; for the hard-billed birds subsist on seeds which are easily carried on board, while soft-billed birds, which are supported by worms and insects, or, what is a succedaneum for them, fresh raw meat, can meet with neither in long and tedious voyages. It is from this defect of food that our collections (curious as they are) are defective, and we are deprived of some of the most delicate and lively genera.

SELBORNE, *Aug.* 1, 1770.

LETTER XXXVII.

To Thomas Pennant, Esq.

You saw, I find, the ring-ousels again among their native crags; and are further assured that they con-

Ring-ousels.

tinue resident in those cold regions the whole year. From whence then do our ring-ousels migrate so regularly every September, and make their appearance again, as if in their return, every April? They are more early this year than common, for some were seen at the usual hill on the fourth of this month.

An observing Devonshire gentleman tells me that

they frequent some parts of Dartmoor, and breed there; but leave those haunts about the end of September or beginning of October, and return again about the end of March.

Another intelligent person assures me that they breed in great abundance all over the Peak of Derby, and are called there tor-ousels; withdraw in October and November, and return in spring. This information seems to throw some light on my new migration.

Scopoli's* new work (which I have just procured) has its merit in ascertaining many of the birds of the Tyrol and Carniola. Monographers, come from whence they may, have, I think, fair pretence to challenge some regard and approbation from the lovers of natural history; for, as no man can alone investigate all the works of nature, these partial writers may, each in their department, be more accurate in their discoveries, and freer from errors, than more general writers; and so by degrees may pave the way to an universal correct natural history. Not that Scopoli is so circumstantial and attentive to the life and conversation of his birds as I could wish: he advances some false facts; as when he says of the *Hirundo urbica* that "it does not feed its young after it leaves the nest:" "pullos extra nidum non nutrit." This assertion I know to be

* "Annus Primus Historico-Naturalis."

wrong from repeated observation this summer; for house-martins do feed their young flying, though it must be acknowledged not so commonly as the house-swallow; and the feat is done in so quick a manner as not to be perceptible to indifferent observers. He also advances some (I was going to say) improbable facts; as when he says of the woodcock that, "as it flies from its enemies, it carries its young in its beak:" "pullos rostro portat fugiens ab hoste." But candour forbids me to say absolutely that any fact is false because I have never been witness to such a fact. I have only to remark, that the long unwieldy bill of the woodcock is perhaps the worst adapted of any among the winged creation for such a feat of natural affection.

SELBORNE, *Sept.* 14, 1770.

LETTER XXXVIII.

TO THE HONOURABLE DAINES BARRINGTON.

I AM glad to hear that Kuckahn is to furnish you with the birds of Jamaica; a sight of the *hirundines* of that hot and distant island would be a great entertainment to me.

The "Anni" of Scopoli are now in my possession; and I have read the "Annus Primus" with satisfaction; for though some parts of this work are

exceptionable, and he may advance some mistaken observations, yet the ornithology of so distant a country as Carniola is very curious. Men that undertake only one district are much more likely to advance natural knowledge than those that grasp at more than they can possibly be acquainted with: every kingdom, every province should have its own monographer.

A "rookstarver."

The reason perhaps why he mentions nothing of Ray's "Ornithology" is the extreme poverty and distance of his country, into which the works of our great naturalist may never yet have found their way. You have doubts, I know, whether this "Ornithology" is genuine, and really the work of Scopoli: as to myself, I think I discover strong tokens of authenticity; the style corresponds with that of his "Entomologia;" and his characters of the ordines and genera are many of them new, express-

ive, and masterly. He has ventured to alter some of the Linnæan genera with sufficient show of reason.

It might perhaps be mere accident that you saw so many swifts and no swallows at Staines; because, in my long observation of those birds, I never could discover the least degree of rivalry or hostility between the species.

Ray remarks that birds of the *Gallinæ* order, as cocks and hens, partridges and pheasants, &c., are *pulveratrices*, such as dust themselves, using that method of cleansing their feathers and ridding themselves of their vermin. As far as I can observe, many birds that dust themselves never wash: and I once thought that those birds that wash themselves would never dust; but here I find myself mistaken; for common house-sparrows are great *pulveratrices*, being frequently seen grovelling and wallowing in dusty roads; and yet they are great washers. Does not the skylark dust?

Query.—Might not Mahomet and his followers take one method of purification from these *pulveratrices?* because I find, from travellers of credit, that if a strict Mussulman is journeying in a sandy desert where no water is to be found, at stated hours he strips off his clothes, and most scrupulously rubs his body over with sand or dust.

A countryman told me he had found a young fern-owl in the nest of a small bird on the ground; and that it was fed by the little bird. I went to see

this extraordinary phenomenon, and found that it was a young cuckoo hatched in the nest of a titlark: it was become vastly too big for its nest, appearing "to have its large wings extended beyond the nest,"—

"— — — — — in tenui re
Majores pennas indo extendisse — —"

and was very fierce and pugnacious, pursuing my finger, as I teased it, for many feet from the nest, and sparring and buffeting with its wings like a game-cock. The dupe of a dam appeared at a distance, hovering about with meat in its mouth, and expressing the greatest solicitude.

In July I saw several cuckoos skimming over a large pond; and found, after some observation, that they were feeding on the *libellulæ*, or dragon-flies; some of which they caught as they settled on the weeds, and some as they were on the wing. Notwithstanding what Linnæus says, I cannot be induced to believe that they are birds of prey.

This district affords some birds that are hardly ever heard of at Selborne. In the first place considerable flocks of cross-beaks (*Loxiæ curvirostræ*) have appeared this summer in the pine-groves belonging to this house: the water-ousel is said to haunt the mouth of the Lewes river, near Newhaven: and the Cornish chough builds, I know, all along the chalky cliffs of the Sussex shore.

I was greatly pleased to see little parties of ring-

ousels (my newly discovered migrators) scattered, at intervals, all along the Sussex downs from Chichester to Lewes. Let them come from whence they will, it looks very suspicious that they are cantoned along the coast, in order to pass the Channel when severe weather advances. They visit us again in April, as it should seem, in their return; and are not to be found in the dead of winter. It is remarkable that they are very tame, and seem to have no manner of apprehensions of danger from a person with a gun.

There are bustards on the wide downs near Brighthelmstone. No doubt you are acquainted with the Sussex downs: the prospects and rides round Lewes are most lovely!

As I rode along near the coast I kept a very sharp look-out in the lanes and woods, hoping I might, at this time of the year, have discovered some of the summer short-winged birds of passage crowding towards the coast in order for their departure; but it was very extraordinary that I never saw a redstart, whitethroat, blackcap, uncrested wren, fly-catcher, &c. And I remember to have made the same remark in former years, as I usually come to this place annually about this time. The birds most common along the coast at present are the stone-chatters, whinchats, buntings, linnets, some few wheatears, titlarks, &c. Swallows and house-martins abound yet, induced to prolong their stay by this soft, still, dry season.

A land tortoise, which has been kept for thirty years in a little walled court belonging to the house where I now am visiting, retires under ground about the middle of November, and comes forth again about the middle of April. When it first appears in the spring it discovers very little inclination towards food: but in the height of summer grows voracious: and then as the summer declines its appetite declines also; so that for the last six weeks in autumn it hardly eats at all. Milky plants, such as lettuces, dandelions, sowthistles, are its favourite dish. In a neighbouring village one was kept till by tradition it was supposed to be a hundred years old. An instance of vast longevity in such a poor reptile.

RINGMER, *near* LEWES, *Oct.* 8, 1770.

LETTER XXXIX.

TO THOMAS PENNANT, ESQ.

AFTER an ineffectual search in Linnæus and Brisson, I begin to suspect that I discern my brother's *Hirundo hyberna* in Scopoli's new discovered *Hirundo rupestris*. His description of "Supra murina, subtus albida; rectrices maculâ ovali albâ in latere interno; pedes nudi, nigri; rostrum nigrum; remiges obscuriores quam plumæ dorsales; rectrices remigibus

concolores, caudâ emarginatâ, nec forcipatâ;" * agrees very well with the bird in question; but when he comes to advance that it is "statura hirundinis urbicæ," and that "the definition given of the bank-martin suits this bird also,"—"definitio hirundinis ripariæ Linnæi huic quoque convenit," he in some measure invalidates all he has said; at least he shows at once that he compares them to these species merely from memory: for I have compared the birds themselves, and find they differ widely in every circumstance of shape, size, and colour. However, as you will have a specimen, I shall be glad to hear what your judgment is in the matter.

Whether my brother is forestalled in his nondescript or not, he will have the credit of first discovering that they spend their winters under the warm and sheltery shores of Gibraltar and Barbary.

Scopoli's characters of his ordines and genera are clear, just, and expressive, and much in the spirit of Linnæus. These few remarks are the result of my first perusal of Scopoli's "Annus Primus."

The bane of our science is the comparing one animal to the other by memory: for want of caution in this particular Scopoli falls into errors: he is not so full with regard to the manners of his indigenous

* "Above it is mouse-colour, below whitish, the guiding feathers with an oval white spot on the inner side, the feet bare and black, the beak black, the wing feathers darker than the dorsal ones, the guiders of the same colour as the wings, the tail well defined, not forked."

birds as might be wished, as you justly observe: his Latin is easy, elegant, and expressive, and very superior to Kramer's "Elenchus Vegetabilium et Animalium per Austriam Inferiorem."

I am pleased to see that my description of the moose corresponds so well with yours.

SELBORNE, *Oct.* 29, 1870.

LETTER XL.

TO THOMAS PENNANT, ESQ.

I WAS much pleased to see, among the collection of birds from Gibraltar, some of those short-winged English summer birds of passage concerning whose departure we have made so much inquiry. Now, if these birds are found in Andalusia to migrate to and from Barbary, it may easily be supposed that those that come to us may migrate back to the Continent, and spend their winters in some of the warmer parts of Europe. This is certain, that many soft-billed birds that come to Gibraltar appear there only in spring and autumn, seeming to advance in pairs towards the northward, for the sake of breeding during the summer months, and retiring in parties and broods towards the south, at the decline of the year: so that the rock of Gibraltar is the great rendezvous and place of observation from whence they take their

departure each way towards Europe or Africa. It is therefore no mean discovery, I think, to find that our small short-winged summer birds of passage are to be seen spring and autumn on the very skirts of Europe; it is a presumptive proof of their emigrations.

Scopoli seems to me to have found the *Hirundo melba*, the great Gibraltar swift, in Tyrol, without knowing it. For what is his *Hirundo alpina* but the afore-mentioned bird in other words? Says he, "It has all the qualities of the preceding, save that the breast is white; it is a little larger than the former;" "Omnia prioris" (meaning the swift); "sed pectus album; paulo major priore." I do not suppose this to be a new species. It is true also of the *melba*, that "it builds on the lofty Alpine cliffs;" "nidificat in excelsis Alpium rupibus." *Vide* "Annum Primum."

My Sussex friend, a man of observation and good sense, but no naturalist, to whom I applied on account of the stone-curlew (*oedicnemus*), sends me the following account:—"In looking over my 'Naturalist's Journal' for the month of April, I find the stone-curlews are first mentioned on the 17th and 18th, which dates seem to me rather late. They live with us all the spring and summer, and at the beginning of autumn prepare to take leave by getting together in flocks. They seem to me a bird of passage that may travel into some dry hilly country south of us, probably Spain, because of the abundance of sheep-walks in that country; for they spend their summers

with us in such districts. This conjecture I hazard, as I have never met with any one that has seen them in England in the winter. I believe they are not fond of going near the water, but feed on earth-worms, that are common on sheep-walks and downs. They breed on fallows and lay fields abounding with grey mossy flints, which much resemble their young in colour; among which they skulk and conceal themselves. They make no nest, but lay their eggs on the bare ground, producing in common but two at a time. There is reason to think their young run soon after they are hatched; and that the old ones do not feed them, but only lead them about at the time of feeding, which for the most part is in the night." Thus far my friend.

In the manners of this bird you see there is something very analogous to the bustard, whom it also somewhat resembles in aspect and make, and in the structure of its feet.

For a long time I have desired my relation to look out for these birds in Andalusia; and now he writes me word that, for the first time, he saw one dead in the market on the 3rd of September.

When the stone-curlew (*oedicnemus*) flies, it stretches out its legs straight behind, like a heron.

SELBORNE, *Nov.* 26, 1770.

LETTER XLI.

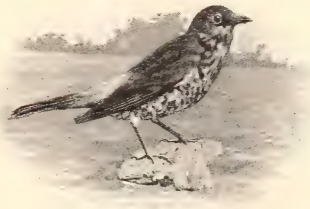
To the Honourable Daines Barrington.

The birds that I took for *aberdavines* were reed-sparrows (*Passeres torquati*).

There are doubtless many home internal migrations within this kingdom that want to be better understood; witness those vast flocks of hen chaffinches that appear with us in the winter with hardly any cocks among them. Now, was there a due proportion of each sex, it would seem very improbable that any one district should produce such numbers of these little birds; and much more when only one half of the species appears; therefore we may conclude that the *Fringillæ cœlebes*, for some good purposes, have a peculiar migration of their own in which the sexes part. Nor should it seem so wonderful that the intercourse of sexes in this species of birds should be interrupted in winter; since in many animals, and particularly in bucks and does, the sexes herd separately, except at the season when commerce is necessary for the continuance of the breed. For this matter of the chaffinches, see "Fauna Suecica," p. 85, and "Systema Naturæ," p. 318. I see every winter vast flights of hen chaffinches, but none of cocks.

Your method of accounting for the periodical motions of the British singing birds, or birds of flight, is a very probable one; since the matter of

food is a great regulator of the actions and proceedings of the brute creation: there is but one that can be set in competition with it, and that is love. But I cannot quite acquiesce with you in one circumstance which you advance—that "when they have thus feasted, they again separate into small parties of five or six, and get the best fare they can within a certain district, having no inducement to go in quest of fresh-turned earth." Now if you mean that the business of congregating is quite at an end from the conclusion of wheat-sowing to the season of barley and oats, it is not the case with us; for larks and chaffinches, and particularly linnets, flock and congregate as much in the very dead of winter as when the husbandman is busy with his ploughs and harrows.



A fieldfare.

Surely there can be no doubt but that woodcocks and fieldfares leave us in the spring, in order to cross the seas, and retire to some districts more suitable to the purpose of breeding. That the former pair, and that the hens are forward with egg before they retire, I myself, when I was a sportsman, have often experienced. It cannot indeed be denied that now and then we hear of a woodcock's nest, or even young birds, discovered in some part or other of this

island: but then they are always mentioned as rarities, and somewhat out of the common course of things; but as to redwings and fieldfares, no sportsman or naturalist has ever yet, that I could hear, pretended to have found the nest or young of those species in any part of these kingdoms. And I the more admire at this instance as extraordinary, since, to all appearance, the same food in summer as well as in winter might support them here which maintains their congeners, the blackbirds and thrushes, did they choose to stay the summer through. Hence it appears that it is not food alone which determines some species of birds with regard to their stay or departure. Fieldfares and redwings disappear sooner or later, according as the warm weather comes on earlier or later, for I well remember, after that dreadful winter, 1739–40, that cold north-east winds continued to blow on through April and May, and that these kinds of birds (what few remained of them) did not depart as usual, but were seen lingering about till the beginning of June.

The best authority that we can have for the nidification of the birds above-mentioned in any district, is the testimony of faunists that have written professedly the natural history of particular countries. Now, as to the fieldfare, Linnæus, in his "Fauna Suecica," says of it, that "it builds in the largest trees,"—"maximis in arboribus nidificat;" and of the redwing he says, in the same place, that "it builds in

the middle of shrubs or hedges, and lays six bluish-green eggs with black spots,"—"nidificat in mediis arbusculis, sive sepibus: ova sex cæruleoviridia maculis nigris variis." Hence we may be assured that fieldfares and redwings breed in Sweden. Scopoli says, in his "Annus Primus," of the woodcock, that "it comes to us about the vernal equinox, and, after pairing, it builds its nest in marshy places, and lays its eggs,"—"nupta ad nos venit circa æquinoctium vernale;" meaning in Tyrol, of which he is a native. And afterwards he adds,—"nidificat in paludibus alpinis: ova ponit 3—5." It does not appear from Kramer that woodcocks breed at all in Austria; but he says:—"This bird dwells in the northern regions in summer, where, too, it generally builds its nest. As winter comes on it goes farther south, leaving this about the October full-moon. After pairing, it usually comes back to the north about the full March moon,"—"Avis hæc septentrionalium provinciarum æstivo tempore incola est; ubi plerumque nidificat. Appropinquante hyeme australiores provincias petit: hinc circa plenilunium mensis Octobris plerumque Austriam transmigrat. Tunc rursus circa plenilunium potissimum mensis Martii per Austriam matrimonio juncta ad septentrionales provincias redit." For the whole passage (which I have abridged) see "Elenchus," &c., p. 351. This seems to be a full proof of the migration of woodcocks; though little is proved concerning the place of breeding.

There fell in the county of Rutland, in three weeks of this present very wet weather, seven inches and a-half of rain, which is more than has fallen in any three weeks for these thirty years past in that part of the world. A mean quantity in that county for one year is twenty inches and a-half.

SELBORNE, *Dec.* 20, 1770.

LETTER XLII.

TO THE HONOURABLE DAINES BARRINGTON.

YOU are, I know, no great friend to migration; and the well-attested accounts from various parts of the kingdom seem to justify you in your suspicions, that at least many of the swallow kind do not leave us in the winter, but lay themselves up like insects and bats, in a torpid state, and slumber away the more uncomfortable months till the return of the sun and fine weather awakens them.

But then we must not, I think, deny migration in general; because migration certainly does subsist in some places, as my brother in Andalusia has fully informed me. Of the motions of these birds he has ocular demonstration, for many weeks together, both spring and fall: during which periods myriads of the swallow kind traverse the Straits from north to south, and from south to north, according to the sea-

son; and these vast migrations consist not only of *hirundines*, but of bee-birds, hoopoes, *Oro pendolos*, or golden thrushes, &c. &c., and also of many of our soft-billed summer birds of passage; and moreover of birds which never leave us, such as all the various sorts of hawks and kites. Old Belon, two hundred years ago, gives a curious account of the incredible armies of hawks and kites which he saw in the spring-time traversing the Thracian Bosporus from Asia to Europe. Besides the above-mentioned, he remarks that the procession is swelled by whole troops of eagles and vultures.

Now it is no wonder that birds residing in Africa, and especially birds of prey whose blood being heated with hot animal food are more impatient of a sultry climate, should retreat before the sun as it advances, and retire to milder regions; but then I cannot help wondering why kites and hawks, and such hardy birds as are known to defy all the severity of England, and even of Sweden and all north Europe, should want to migrate from the south of Europe, and be dissatisfied with the winters of Andalusia.

It does not appear to me that much stress can be laid on the difficulty and hazard that birds must run in their migrations, by reason of vast oceans, cross winds, &c.; because, if we reflect, a bird, by crossing the water at Dover, and again at Gibraltar, may travel from England to the equator without launching out and exposing itself to boundless seas. And

I advance this obvious remark with the more confidence, because my brother has always found that some of his birds, and particularly the swallow kind, are very sparing of their pains in crossing the Mediterranean; when arrived at Gibraltar, they do not

"— — — Ranged in figure wedge their way,
— — — — — and set forth
Their airy caravan high over seas
Flying, and over lands with mutual wing
Easing their flight;" — — — — MILTON—

but scout and hurry along in little detached parties of six or seven in a company; and, sweeping low, just over the surface of the land and water, direct their course to the opposite continent at the narrowest passage they can find. They usually slope across the bay to the south-west, and so pass over opposite to Tangier, which, it seems, is the narrowest space.

In former letters we have considered whether it was probable that woodcocks in moonshiny nights cross the German ocean from Scandinavia. As a proof that birds of less speed may pass that sea, considerable as it is, I shall relate the following incident, which, though mentioned to have happened so many years ago, was strictly matter of fact:—As some people were shooting in the parish of Trotton, in the county of Sussex, they killed a duck in that dreadful winter of 1708–9, with a silver collar about its neck,*

* White adds in a note, "I have read a like anecdote of a swan."

on which were engraven the arms of the King of Denmark. This anecdote the rector of Trotton at that time has often told to a near relation of mine; and, to the best of my remembrance, the collar was in the possession of the rector.

At present I do not know anybody near the sea-side that will take the trouble to remark at what time of the moon woodcocks first come: if I lived near the sea myself I would soon tell you more of the matter. One thing I used to observe when I was a sportsman, that there were times in which woodcocks were so sluggish and sleepy, that they would drop again when flushed, just before the spaniels; nay, just at the muzzle of a gun that had been fired at them. Whether this strange laziness was the effect of a recent fatiguing journey I shall not presume to say.

Nightingales not only never reach Northumberland and Scotland, but also, as I have been always told, Devonshire and Cornwall. In those two last counties we cannot attribute the failure of them to the want of warmth: the defect in the west is rather a presumptive argument that these birds come over to us from the Continent at the narrowest passage, and do not stroll so far westward.

Let me hear from your own observation whether skylarks do not dust. I think they do: and if they do, whether they wash also.

The *Alauda pratensis* of Ray was the poor dupe

that was educating the booby of a cuckoo mentioned in Letter XXXVIII. in October last.

Your letter came too late for me to procure a ring-ousel for Mr. Tunstal during their autumnal visit; but I will endeavour to get him one when they call on us again in April. I am glad that you and that gentleman saw my Andalusian birds; I hope they answered your expectation. Royston, or grey crows, are winter birds that come much about the same time with the woodcock: they, like the fieldfare and redwing, have no apparent reason for migration; for as they fare in the winter like their congeners, so might they in all appearance in the summer. Was not Tenant, when a boy, mistaken? Did he not find a missel-thrush's nest, and take it for the nest of a fieldfare?

The stock-dove or wood-pigeon, *Ænas Raii*, is the last winter bird of passage which appears with us; and is not seen till towards the end of November; about twenty years ago they abounded in the district of Selborne; and strings of them were seen, morning and evening, that reached a mile or more; but since the beechen woods have been greatly thinned they are much decreased in number. The ring-dove, *Palumbus Raii*, stays with us the whole year, and breeds several times through the summer.

Before I received your letter of October last I had just remarked in my journal that the trees were unusually green. This uncommon verdure lasted on

late into November; and may be accounted for from a late spring, a cool and moist summer; but more particularly from vast armies of chafers, or tree-beetles, which, in many places, reduced whole woods to a leafless naked state. These trees shot again at Midsummer, and then retained their foliage till very late in the year.

My musical friend, at whose house I am now visiting, has tried all the owls that are his near neighbours with a pitch-pipe set at concert-pitch, and finds they all hoot in B flat. He will examine the nightingales next spring.

FYFIELD, *near* ANDOVER, *Feb.* 12, 1771.

LETTER XLIII.

TO THOMAS PENNANT, ESQ.

THERE is an insect with us, especially on chalky districts, which is very troublesome and teasing all the latter end of the summer, getting into people's skins, especially those of women and children, and raising tumours which itch intolerably. This animal (which we call a harvest bug) is very minute, scarce discernible to the naked eye; of a bright scarlet colour, and of the genus of *acarus*.* They are to be met

* *Leptus autumnalis* of Latreille.

with in gardens on kidneybeans, or any legumens, but prevail only in the hot months of summer. War-

Entrance to an old Selborne lane.

reners, as some have assured me, are much infested by them on chalky-downs, where these insects sometimes swarm to so infinite a degree as to discolour their nets, and to give them a reddish cast, while the men are so bitten as to be thrown into fevers.

There is a small long shining fly in these parts

very troublesome to the housewife, by getting into the chimneys, and laying its eggs in the bacon while it is drying: these eggs produce maggots called jumpers, which, harbouring in the gammons and best parts of the hogs, eat down to the bone, and make great waste. This fly I suspect to be a variety of the *Musca putris* of Linnæus: it is to be seen in the summer in farm-kitchens, on the bacon-racks and about the mantelpieces, and on the ceilings.

The insect that infests turnips and many crops in the garden (destroying often whole fields while in their seedling leaves) is an animal that wants to be better known. The country people here call it the turnip-fly and black dolphin; but I know it to be one of the *coleoptera;* the "*Chrysomela oleracea* saltatoria, femoribus posticis crassissimis"—"the vaulting *chrysomela*, with the back part of the thighs very thick." In very hot summers they abound to an amazing degree, and, as you walk in a field or in a garden, make a pattering like rain, by jumping on the leaves of the turnips or cabbages.

There is an *oestrus*, known in these parts to every ploughboy, which, because it is omitted by Linnæus,* is also passed over by late writers, and that is the *curvicauda* of old Moufet, mentioned by Derham in his "Physico-Theology," p. 250: an insect worthy of

* This is a mistake on White's part: the Horse Bot-fly, *Gasterophilus equi*, Leach, is described by Linnæus under the name of *Œstrus bovis*.

remark for depositing its eggs as it flies in so dexterous a manner on the single hairs of the legs and flanks of grass-horses. But then Derham is mistaken when he advances that this *oestrus* is the parent of that wonderful star-tailed maggot which he mentions afterwards; for more modern entomologists have discovered that singular production to be derived from the egg of the *Musca chamæleon.**

A full history of noxious insects hurtful in the field, garden, and house, suggesting all the known and likely means of destroying them, would be allowed by the public to be a most useful and important work. What knowledge there is of this sort lies scattered, and wants to be collected; great improvements would soon follow of course. A knowledge of the properties, economy, propagation, and, in short, of the life and conversation of these animals, is a necessary step to lead us to some method of preventing their depredations.

As far as I am a judge, nothing would recommend entomology more than some neat plates that should well express the generic distinctions of insects according to Linnæus; for I am well assured that many people would study insects, could they set out with a more adequate notion of those distinctions than can be conveyed at first by words alone.

SELBORNE, *March* 30, 1771.

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* *Stratiomys chamæleon*, De Geer.

LETTER XLIV

To Thomas Pennant, Esq.

Happening to make a visit to my neighbour's peacocks, I could not help observing that the trains of those magnificent birds appear by no means to be their tails; those long feathers growing not from their *uropygium*, but all up their backs. A range of short, brown, stiff feathers, about six inches long, fixed in the *uropygium*, is the real tail, and serves as the fulcrum to prop the train, which is long and top-heavy when set on end. When the train is up, nothing appears of the bird before but its head and neck; but this would not be the case were those long feathers fixed only in the rump, as may be seen by the turkey-cock when in a strutting attitude. By a strong muscular vibration these birds can make the shafts of their long feathers clatter like the swords of a sword-dancer: they then trample very quick with their feet and run backwards towards the females.

I should tell you that I have got an uncommon *Calculus ægogropila*, taken out of the stomach of a fat ox; it is perfectly round, and about the size of a large Seville orange; such are, I think, usually flat.

Selborne, 1771.

LETTER XLV.

To the Honourable Daines Barrington.

From what follows, it will appear that neither owls nor cuckoos keep to one note. My musical friend remarks that many (most) of his owls hoot in B flat; but that one went almost half a note below A. The pipe he tried their notes by was a common half-crown pitch-pipe, such as masters use for the tuning of harpsichords; it was the common London pitch.

A neighbour of mine, who is said to have a nice ear, remarks that the owls about this village hoot in three different keys—in G flat, or F sharp, in B flat and A flat. He heard two hooting to each other, the one in A flat, and the other in B flat. Do these different notes proceed from different species, or only from various individuals? The same person finds upon trial that the note of the cuckoo (of which we have but one species) varies in different individuals; for, about Selborne wood, he found they were mostly in D: he heard two sing together, the one in D, the other in D sharp, which made a disagreeable concert; he afterwards heard one in D sharp, and about Wolmer Forest some in C.* As to nightingales, he says that their notes are so short and their transitions so

* The editor of the edition of 1822 remarks that the cuckoo begins early in the season with a tray or third, next to a fourth, then a fifth, after which his voice breaks without attaining a sixth; a very old obser-

rapid, that he cannot well ascertain their key. Perhaps in a cage, and in a room, their notes may be more distinguishable. This person has tried to settle the notes of a swift, and of several other small birds, but cannot bring them to any criterion.

A redwing.

As I have often remarked that redwings are some of the first birds that suffer with us in severe weather, it is no wonder at all that they retreat from Scandinavian winters: and much more the *ordo* of *grallæ* which, all to a bird, forsake the northern parts of Europe at the approach of winter. "Grallæ tanquam conjuratæ unanimiter in fugam se conjiciunt; ne earum unicam quidem inter nos habitantem invenire possimus; ut enim æstate in australibus degere nequeunt ob defectum lumbricorum, terramque siccam; ita nec in frigidis ob eandem causam," says Ekmarck the Swede, in his ingenious little treatise

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vation, however, seeing it is the subject of an epigram in the scarce black letter, "Epigrams of John Heywood," dated 1587:—

"Use maketh maistry, this hath been said alway;
But all is not alway as all men do say.
In April, the koocoo can sing her song by rote,
In June of tune she cannot sing a note:
At first koocoo, koocoo, sing still can she do;
At last kooke, kooke, kooke, six kookes to one coo."

called "Migrationes Avium," which by all means you ought to read while your thoughts run on the subject of migration.—"The *grallæ*, as though they had conspired, take themselves to flight in an unmannerly fashion; nor can we find even one dwelling amongst us; for as they cannot live in the south during summer because of the dryness of the ground, so neither can they live in the cold countries of the north in winter for the contrary reason."

Birds may be so circumstanced as to be obliged to migrate in one country and not in another: but the *grallæ* (which procure their food from marshes and boggy grounds) must in winter forsake the more northerly parts of Europe, or perish for want of food.

I am glad you are making inquiries from Linnæus concerning the woodcock: it is expected of him that he should be able to account for the motions and manner of life of the animals of his own "Fauna."

Faunists, as you observe, are too apt to acquiesce in bare descriptions and a few synonyms: the reason is plain; because all that may be done at home in a man's study, but the investigation of the life and conversation of animals is a concern of much more trouble and difficulty, and is not to be attained but by the active and inquisitive, and by those that reside much in the country.

Foreign systematics are, I observe, much too vague in their specific differences; which are almost universally constituted by one or two particular

marks, the rest of the description running in general terms. But our countryman, the excellent Mr. Ray, is the only describer that conveys some precise idea in every term or word, maintaining his superiority over his followers and imitators in spite of the advantage of fresh discoveries and modern information.

At this distance of years it is not in my power to recollect at what periods woodcocks used to be sluggish or alert when I was a sportsman: but upon my mentioning this circumstance to a friend, he thinks he has observed them to be remarkably listless against snowy foul weather: if this should be the case, then the inaptitude for flying arises only from an eagerness for food; as sheep are observed to be very intent on grazing against stormy wet evenings.

SELBORNE, *Aug.* 1, 1771.

LETTER XLVI.

TO THOMAS PENNANT, ESQ.

THE summer through I have seen but two of that large species of bat which I call *Vespertilio altivolans*, from its manner of feeding high in the air: I procured one of them, and found it to be a male; and made no doubt, as they accompanied together, that the other was a female; but happening in an evening or two to procure the other likewise, I was somewhat

disappointed when it appeared to be also of the same sex. This circumstance and the great scarcity of this sort, at least in these parts, occasions some suspicions in my mind whether it is really a species, or whether it may not be the male part of the more known species, one of which may supply many females; as is known to be the case in sheep, and some other quadrupeds. But this doubt can only be cleared by a farther examination, and some attention to the sex, of more specimens: all that I know at present is, that my two were amply furnished with the parts of generation much resembling those of a boar.

In the extent of their wings they measured fourteen inches and a half: and four inches and a half from the nose to the tip of the tail: their heads were large, their nostrils bilobated, their shoulders broad and muscular, and their whole bodies fleshy and plump. Nothing could be more sleek and soft than their fur, which was of a bright chestnut colour; their maws were full of food, but so macerated that the quality could not be distinguished; their livers, kidneys, and hearts were large, and their bowels covered with fat. They weighed each, when entire, full one ounce and one drachm. Within the ear there was somewhat of a peculiar structure that I did not understand perfectly; but refer it to the observation of the curious anatomist. These creatures sent forth a very rancid and offensive smell.

Sept. 1771.

LETTER XLVII.

To Thomas Pennant, Esq.

On the 12th of July I had a fair opportunity of contemplating the motions of the *caprimulgus*, or fern-owl, as it was playing round a large oak that swarmed with *Scarabæi solstitiales*, or fern-chafers. The powers of its wing were wonderful, exceeding, if possible, the various evolutions and quick turns of the swallow genus. But the circumstance that pleased me most was, that I saw it distinctly, more than once, put out its short leg while on the wing, and, by a bend of the head, deliver somewhat into its mouth. If it takes any part of its prey with its foot, as I have now the greatest reason to suppose it does these chafers, I no longer wonder at the use of its middle toe, which is curiously furnished with a serrated claw.

Swallows and martins, the bulk of them I mean, have forsaken us sooner this year than usual: for, on the 22nd of September, they rendezvoused in a neighbour's walnut-tree, where it seemed probable they had taken up their lodgings for the night. At the dawn of the day, which was foggy, they arose all together in infinite numbers, occasioning such a rushing from the strokes of their wings against the hazy air, as might be heard to a considerable distance: since that no flock has appeared, only a few stragglers.

Some swifts staid late, till the 22nd of August—a rare instance! for they usually withdraw within the first week.*

On the 24th of September three or four ring-ousels appeared in my fields for the first time this season! how punctual are these visitors in their autumnal and spring migrations!

SELBORNE, 1771.

LETTER XLVIII.

TO THE HONOURABLE DAINES BARRINGTON.

WHEN I ride about in the winter, and see such prodigious flocks of various kinds of birds, I cannot help admiring these congregations, and wishing that it was in my power to account for those appearances almost peculiar to the season. The two great motives which regulate the proceedings of the brute creation are love and hunger; the former incites animals to perpetuate their kind, the latter induces them to preserve individuals; whether either of these should seem to be the ruling passion in the matter of congregating is to be considered. As to love, that is out of the question at a time of the year when that soft passion is not indulged; besides, during the amorous season, such a jealousy prevails be-

* See Letter XCVI. to Mr. Barrington.

tween the male birds that they can hardly bear to be together in the same hedge or field. Most of the singing and elation of spirits of that time seem to me to be the effect of rivalry and emulation; and it is to this spirit of jealousy that I chiefly attribute the equal dispersion of birds in the spring over the face of the country.

A rook.

Now as to the business of food: as these animals are actuated by instinct to hunt for necessary food, they should not, one would suppose, crowd together in pursuit of sustenance at a time when it is most likely to fail; yet such associations do take place in hard weather chiefly, and thicken as the severity increases. As some kind of self-interest and self-defence is no doubt the motive for the proceeding, may it not arise from the helplessness of their state in such rigorous seasons? just as men crowd together when under great calamities, though they know not why. Perhaps approximation may dispel some degree of cold; and

a crowd may make each individual appear safer from the ravages of birds of prey and other dangers.

If I admire when I see how much congenerous birds love to congregate, I am the more struck when I see incongenerous ones in such strict amity. If we do not much wonder to see a flock of rooks usually attended by a train of daws, yet it is strange that the former should so frequently have a flight of starlings for their satellites. Is it because rooks have a more discerning scent than their attendants, and can lead them to spots more productive of food? Anatomists say that rooks, by reason of two large nerves which run down between the eyes into the upper mandible, have a more delicate feeling in their beaks than other round-billed birds, and can grope for their meat when out of sight. Perhaps then their associates attend them on the motive of interest, as greyhounds wait on the motions of their finders; and as lions

A starling.

are said to do on the yelpings of jackals. Lapwings and starlings sometimes associate.

SELBORNE, *Feb.* 8, 1772.

LETTER XLIX.

TO THE HONOURABLE DAINES BARRINGTON.

As a gentleman and myself were walking on the 4th of last November round the sea-banks at Newhaven, near the mouth of the Lewes river, in pursuit of natural knowledge, we were surprised to see three house-swallows gliding very swiftly by us. That morning was rather chilly, with the wind at north-west; but the tenor of the weather for some time before had been delicate, and the noons remarkably warm. From this incident, and from repeated accounts which I meet with, I am more and more induced to believe that many of the swallow kind do not depart from this island; but lay themselves up in holes and caverns; and do, insect-like and bat-like,* come forth at mild times, and then retire again

* Concerning swallows, the reader will see that Mr. White appears to incline more and more in favour of their torpidity, and against their migration. Mr. D. Barrington is still more positive on the same side of the question; yet the ancients generally mention this bird as wintering in Africa. See Anacreon λγ. ed. Brunck. p. 38. The Rhodians had a festival called χελιδόνια, when the boys brought about young swallows;

to their *latebræ*. Nor make I the least doubt but that, if I lived at Newhaven, Seaford, Brighthelmstone, or any of those towns near the chalk-cliffs of the Sussex coast, I should by proper observations, see swallows stirring at periods of the winter when the noons were soft and inviting and the sun warm and invigorating. And I am the more of this opin-

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the song which they sang may be seen in the works of Meursius, v. 3, p. 974, fol.

Ἦλθε, Ἦλθε, χελιδὼν καλὰς,
Ὥρας ἄγουσα, καὶ καλοὺς Ἐνιαυτοὺς
Ἔπι γάστερα λευκὰ, κ' ἔπι νῶτα μέλαινα.

"He comes! He comes! who loves to bear
Soft sunny hours and seasons fair;—
The swallow hither comes to rest
His sable wing and snowy breast."

And alluding to this custom, Avienus (who may be considered only as a very bad translator of an excellent poem, the "Periegesis" of Dionysius) thus says, v. 705,—

"Nam cum vere novo, tellus se dura relaxat,
Culminibusque cavis, blandum strepit ales hirundo
Gens devota choros agitat!"

"When in early spring the iron soil relaxes, comes the swallow chirping pleasantly from the hollow eaves, and the pious people begin to dance."

From a passage in the "Birds" of Aristophanes, we learn that among the Greeks the *crane* pointed out the time of *sowing;* the arrival of the *kite*, the time of *sheep-shearing;* and the *swallow*, the time to put on *summer-clothes*. According to the Greek calendar of Flora, kept by Theophrastus at Athens, the Ornithian winds blow, and the swallow comes between the 28th of February and the 12th of March; the kite and nightingale appear between the 11th and 26th of March; the cuckoo appears at the same time the young figs come out, thence his name.—STILLINGFLEET'S *Tracts on Natural History.*

ion from what I have remarked during some of our late springs, that though some swallows did make their appearance about the usual time, namely, the 13th or 14th of April, yet meeting with a harsh reception, and blustering cold north-east winds, they immediately withdrew, absconding for several days, till the weather gave them better encouragement.

March 9, 1772.

LETTER L.

To Thomas Pennant, Esq.

By my journal for last autumn it appears that the house-martins bred very late, and staid very late in these parts; for on the 1st of October I saw young martins in their nest nearly fledged; and, again, on the 21st of October, we had at the next house a nest full of young martins just ready to fly; and the old ones were hawking for insects with great alertness. The next morning the brood forsook their nest, and were flying round the village. From this day I never saw one of the swallow kind till the 3rd of November; when twenty, or perhaps thirty, house-martins were playing all day long by the side of the hanging wood, and over my fields. Did these small weak birds, some of which were nestlings twelve days ago, shift their quarters at this late season of the year to the other side of the northern tropic? Or rather, is

it not more probable that the next church, ruin, chalk-cliff, steep covert, or perhaps sand-bank, lake, or pool, may become their hybernaculum, and afford them a ready and obvious retreat?

We now begin to expect our vernal migration of ring-ousels every week. Persons worthy of credit assure me that ring-ousels were seen at Christmas 1770 in the forest of Bere, on the southern verge of this county. Hence we may conclude that their migrations are only internal, and not extended to the continent southward, if they do at first come at all from the northern parts of this island only, and not from the north of Europe. Come from whence they will, it is plain, from the fearless disregard that they show for men or guns, that they have been little accustomed to places of much resort. Navigators mention that in the Isle of Ascension, and other such desolate districts, birds are so little acquainted with the human form that they settle on men's shoulders; and have no more dread of a sailor than they would have of a goat that was grazing. A young man at Lewes, in Sussex, assured me that about seven years ago ring-ousels abounded so about that town in the autumn that he killed sixteen himself in one afternoon: he added further, that some had appeared since in every autumn; but he could not find that any had been observed before the season in which he shot so many. I myself have found these birds in little parties in the autumn cantoned all along

the Sussex downs, wherever there were shrubs and bushes, from Chichester to Lewes; particularly in the autumn of 1770.

SELBORNE, *March* 15, 1773.

LETTER LI.

TO THE HONOURABLE DAINES BARRINGTON.

WHILE I was in Sussex last autumn my residence was at the village near Lewes, from whence I had formerly the pleasure of writing to you. On the 1st of November I remarked that the old tortoise, formerly mentioned, began first to dig the ground, in order to the forming its hybernaculum, which it had fixed on just beside a great tuft of hepaticas. It scrapes out the ground with its fore-feet, and throws it up over its back with its hind; but the motion of its legs is ridiculously slow, little exceeding the hour-hand of a clock; and suitable to the composure of an animal said to be a whole month in performing one feat of copulation. Nothing can be more assiduous than this creature night and day in scooping the earth, and forcing its great body into the cavity; but as the noons of that season proved unusually warm and sunny, it was continually interrupted, and called forth by the heat in the middle of the day: and though I continued there till the 13th of November,

yet the work remained unfinished. Harsher weather, and frosty mornings, would have quickened its operations. No part of its behaviour ever struck me more than the extreme timidity it always expresses with regard to rain; for though it has a shell that would secure it against the wheel of a loaded cart, yet does it discover as much solicitude about rain as a lady dressed in all her best attire, shuffling away on the first sprinklings, and running its head up in a corner. If attended to it becomes an excellent weather-glass; for as sure as it walks elate, and as it were on tiptoe, feeding with great earnestness in a morning, so sure will it rain before night. It is totally a diurnal animal, and never pretends to stir after it becomes dark. The tortoise, like other reptiles, has an arbitrary stomach as well as lungs; and can refrain from eating as well as breathing for a great part of the year. When first awakened it eats nothing; nor again in the autumn before it retires: through the height of the summer it feeds voraciously, devouring all the food that comes in its way. I was much taken with its sagacity in discerning those that do it kind offices; for as soon as the good old lady comes in sight who has waited on it for more than thirty years, it hobbles towards its benefactress with awkward alacrity; but remains inattentive to strangers. Thus not only "the ox knoweth its owner, and the ass his master's crib,"*

* Isaiah i. 3.

but the most abject reptile and torpid of beings distinguishes the hand that feeds it, and is touched with the feelings of gratitude!

P. S.—In about three days after I left Sussex the tortoise retired into the ground under the hepatica.

April 12, 1772.

LETTER LII.

To the Honourable Daines Barrington.

The more I reflect on the στοργή of animals, the more I am astonished at its effects. Nor is the violence of this affection more wonderful than the shortness of its duration. Thus every hen is in her turn the virago of the yard, in proportion to the helplessness of her brood; and will fly in the face of a dog or a sow in defence of those chickens, which in a few weeks she will drive before her with relentless cruelty.

This affection sublimes the passions, quickens the invention, and sharpens the sagacity of the brute creation. Thus a hen, just become a mother, is no longer that placid bird she used to be, but with feathers standing on end, wings hovering, and clucking note, she runs about like one possessed. Dams will throw themselves in the way of the greatest danger in order to avert it from their progeny. Thus a partridge will tumble along before a sportsman in order

to draw away the dogs from her helpless covey. In the time of nidification the most feeble birds will assault the most rapacious. All the *hirundines* of a village are up in arms at the sight of a hawk, whom they will persecute till he leaves that district. A very exact observer has often remarked that a pair of ravens nesting in the rock of Gibraltar would suffer no vulture or eagle to rest near their station, but would drive them from the hill with an amazing fury: even the blue thrush at the season of breeding would dart out from the cliffs of the rocks to chase away the kestrel or the sparrow-hawk. If you stand near the nest of a bird that has young, she will not be induced to betray them by an inadvertent fondness, but will wait about at a distance with meat in her mouth for an hour together.

Should I further corroborate what I have advanced above by some anecdotes which I probably may have mentioned before in conversation, yet you will, I trust, pardon the repetition for the sake of the illustration.

The flycatcher of the Zoology (the *Stoparola* of Ray) builds every year in the vines that grow on the walls of my house.

A pair of these little birds had one year inadvertently placed their nest on a naked bough, perhaps in a shady time, not being aware of the inconvenience that followed. But a hot sunny season coming on before the brood was half-fledged, the reflection of

In a Selborne beechwood

the wall became insupportable, and must inevitably have destroyed the tender young, had not affection suggested an expedient, and prompted the parent birds to hover over the nest all the hotter hours, while with wings expanded, and mouths gaping for breath, they screened off the heat from their suffering offspring.

A farther instance I once saw of notable sagacity in a willow-wren, which had built in a bank in my fields. This bird, a friend and myself had observed as she sat in her nest; but were particularly careful not to disturb her, though we saw she eyed us with some degree of jealousy. Some days after, as we passed that way, we were desirous of remarking how this brood went on; but no nest could be found, till I happened to take up a large bundle of long green moss, as it were carelessly thrown over the nest, in order to dodge the eye of any impertinent intruder.

A still more remarkable mixture of sagacity and instinct occurred to me one day as my people were pulling off the lining of a hotbed in order to add some fresh dung. From out of the side of this bed leaped an animal with great agility that made a most grotesque figure; nor was it without great difficulty that it could be taken; when it proved to be a large white-bellied field-mouse with three or four young clinging to her teats by their mouths and feet. It was amazing that the desultory and rapid motions of this dam should not oblige her litter to quit their

hold, especially when it appeared that they were so young as to be both naked and blind!

To these instances of tender attachment, many more of which might be daily discovered by those that are studious of nature, may be opposed that rage of affection, that monstrous perversion of the *στοργή*, which induces some females of the brute creation to devour their young because their owners have handled them too freely, or removed them from place to place! Swine, and sometimes the more gentle race of dogs and cats, are guilty of this horrid and preposterous murder. When I hear now and then of an abandoned mother that destroys her offspring, I am not so much amazed; since reason perverted, and the bad passions let loose, are capable of any enormity: but why the parental feelings of brutes, that usually flow in one most uniform tenor, should sometimes be so extravagantly diverted, I leave to abler philosophers than myself to determine.

SELBORNE, *March* 26, 1773.

LETTER LIII.

TO THE HONOURABLE DAINES BARRINGTON.

SOME young men went down lately to a pond on the verge of Wolmer Forest to hunt flappers, or young wild-ducks, many of which they caught, and,

among the rest, some very minute yet well-fledged wild-fowls alive, which upon examination I found to be teals. I did not know till then that teals ever bred in the south of England, and was much pleased with the discovery: this I look upon as a great stroke in natural history.

We have had, ever since I can remember, a pair of white owls that constantly breed under the eaves of this church. As I have paid good attention to the manner of life of these birds during their season of breeding, which lasts the summer through, the following remarks may not perhaps be unacceptable:—About an hour before sunset (for then the mice begin to run) they sally forth in quest of prey, and hunt all round the hedges of meadows and small inclosures for them, which seem to be their only food. In this irregular country we can stand on an eminence and see them beat the fields over like a setting-dog, often dropping down in the grass or corn. I have minuted these birds with my watch for an hour together, and have found that they return to their nest, the one or the other of them, about once in five minutes; reflecting at the same time on the adroitness that every animal is possessed of as far as regards the well-being of itself and offspring. But a piece of address which they show when they return loaded should not, I think, be passed over in silence. As they take their prey with their claws, so they carry it in their claws to their nest: but as the feet

are necessary in their ascent under the tiles, they constantly perch first on the roof of the chancel, and shift the mouse from their claws to their bill, that the feet may be at liberty to take hold of the plate on the wall as they are rising under the eaves.

White owls seem not (but in this I am not positive) to hoot at all: all that clamorous hooting appears to me to come from the wood kinds. The white owl does indeed snore and hiss in a tremendous manner; and these menaces will answer the intention of intimidating: for I have known a whole village up in arms on such an occasion, imagining the church-yard to be full of goblins and spectres. White owls also often scream horribly as they fly along; from this screaming probably arose the common people's imaginary species of screech-owl, which they superstitiously think attends the windows of dying persons. The plumage of the remiges of the wings of every species of owl that I have yet examined is remarkably soft and pliant. Perhaps it may be necessary that the wings of these birds should not make much resistance or rushing, that they may be enabled to steal through the air unheard upon a nimble and watchful quarry.

While I am talking of owls, it may not be improper to mention what I was told by a gentleman of the county of Wilts. As they were grubbing a vast hollow pollard-ash that had been the mansion of owls for centuries, he discovered at the bottom, a

mass of matter that at first he could not account for. After some examination, he found that it was the congeries of the bones of mice, and perhaps of birds and bats, that had been heaping together for ages, being cast up in pellets out of the crops of many generations of inhabitants. For owls cast up the bones, fur, and feathers of what they devour, after the manner of hawks. He believes, he told me, that there were bushels of this kind of substance.

When brown owls hoot their throats swell as big as a hen's egg. I have known an owl of this species live a full year without any water. Perhaps the case may be the same with all birds of prey. When owls fly they stretch out their legs behind them as a balance to their large heavy heads: for, as most nocturnal birds have large eyes and ears they must have large heads to contain them. Large eyes I presume are necessary to collect every ray of light, and large concave ears to command the smallest degree of sound or noise.*

The *hirundines* are a most inoffensive, harmless, entertaining, social, and useful tribe of birds; they touch no fruit in our gardens: delight, all except one species, in attaching themselves to our houses; amuse us with their migrations, songs, and marvellous

* It will be proper to premise here that the Letters LIII., LV., LVII., and LX., have been published already in the "Philosophical Transactions," but nicer observation has furnished several corrections and additions.

agility ; and clear our outlets from the annoyances of gnats and other troublesome insects. Some districts in the South Seas, near Guiaquil,* are desolated, it seems, by the infinite swarms of venomous mosquitoes, which fill the air, and render those coasts insupportable. It would be worth inquiring whether any species of *hirundines* is found in those regions. Whoever contemplates the myriads of insects that sport in the sunbeams of a summer evening in this country, will soon be convinced to what a degree our atmosphere would be choked with them were it not for the friendly interposition of the swallows.

Many species of birds have their peculiar *lice;* but the *hirundines* alone seem to be annoyed with dipterous insects, which infest every species, and are so large, in proportion to themselves, that they must be extremely irksome and injurious to them. These are the *Hippoboscæ hirundines*, with narrow subulated wings, abounding in every nest; and are hatched by the warmth of the bird's own body during incubation, and crawl about under its feathers.

A species of them is familiar to horsemen in the south of England under the name of forest-fly; and to some of side-fly, from its running sideways like a crab. It creeps under the tails, and about the groins, of horses, which at their first coming out of the north, are rendered half frantic by the tick-

* See Ulloa's "Travels."

ling sensation; while our own breed little regards them.

The curious Réaumur discovered the large eggs, or rather *pupæ*, of these flies as big as the flies themselves, which he hatched in his own bosom. Any person that will take the trouble to examine the old nests of either species of swallows may find in them the black shining cases or skins of the *pupæ* of these insects: but for other particulars, too long for this place, we refer the reader to "L'Histoire d'Insects" of that admirable entomologist—tom. iv. pl. 11.

SELBORNE, *July* 8, 1773.

LETTER LIV.

TO THOMAS PENNANT, ESQ.

As you desire me to send you such observations as may occur, I take the liberty of making the following remarks, that you may, according as you think me right or wrong, admit or reject what I here advance, in your intended new edition of the "British Zoology."

The osprey was shot about a year ago at Frinsham pond, a great lake, about six miles from hence, while it was sitting on the handle of a plough and devouring a fish: it used to precipitate itself into the water, and so take its prey by surprise.

A great ash-coloured butcher-bird was shot last winter in Tisted Park, and a red-backed butcher-bird at Selborne: they are *raræ aves* in this county.

Crows go in pairs the whole year round.

A crow.

Cornish choughs abound, and breed on Beachy Head and on all the cliffs of the Sussex coast.

The common wild pigeon, or stock-dove, is a bird of passage in the south of England, seldom appearing till towards the end of November; and is usually the latest winter-bird of passage. Before our beechen woods were so much destroyed, we had myriads of them, reaching in strings for a mile together as they went out in a morning to feed. They leave us early in spring; where do they breed?

The people of Hampshire and Sussex call the missel-bird the storm-cock, because it sings early in the spring in blowing showery weather; its song often commences with the year: with us it builds much in orchards.

A gentleman assures me he has taken the nests of ring-ousels on Dartmoor; they build in banks on the sides of streams.

Titlarks not only sing sweetly as they sit on trees, but also as they play and toy about on the wing; and particularly while they are descending, and sometimes as they stand on the ground.

Adanson's testimony seems to me to be a very poor evidence that European swallows migrate during our winter to Senegal: he does not talk at all like an ornithologist; and probably saw only the swallows of that country, which I know build within Governor O'Hara's hall against the roof. Had he known European swallows, would he not have mentioned the species?

The house-swallow washes by dropping into the water as it flies: this species appears commonly about a week before the house-martin, and about ten or twelve days before the swift.

In 1772 there were young house-martins in their nest till the 23rd of October.

The swift appears about ten or twelve days later than the house-swallow: viz. about the 24th or the 26th of April.

Whin-chats and stone-chatters stay with us the whole year.

Some wheat-ears continue with us the winter through.

Wagtails of all sorts remain with us all the winter.

Bullfinches when fed on hempseed often become wholly black.

We have vast flocks of female chaffinches all the winter, with hardly any males among them.

When you say that in breeding time the cock-snipes make a bleating noise, and I a drumming sound (perhaps I should have rather said a humming), I suspect we mean the same thing. However while they are playing about on the wing they certainly make a loud piping with their mouths: but whether that bleating or humming is ventriloquous, or proceeds from the motion of their wings, I cannot say; but this I know, that when this noise happens, the bird is always descending, and his wings are violently agitated.

A bullfinch.

Soon after the lapwings have done breeding they congregate, and leaving the moors and marshes, betake themselves to downs and sheep-walks.

Two years ago last spring the little auk was found alive and unhurt, but fluttering and unable to rise, in

a lane a few miles from Alresford, where there is a great lake: it was kept a while, but died.

I saw young teals taken alive in the ponds of Wolmer Forest in the beginning of July last, along with flappers, or young wild ducks.

All the swallow kind sip their water as they sweep over the face of pools or rivers: like Virgil's bees they drink flying — "flumina summa libant." In this method of drinking perhaps this genus may be peculiar.

Lapwings.

The sedge-bird sings most part of the night; its notes are hurrying, but not unpleasing, and imitative

of several birds; as the sparrow, swallow, skylark. When it happens to be silent in the night, by throwing a stone or clod into the bushes where it sits you immediately set it a singing; or in other words, though it slumbers sometimes, yet as soon as it is awakened it reassumes its song.

SELBORNE, *Nov.* 9, 1773.

LETTER LV.

TO THE HONOURABLE DAINES BARRINGTON.

IN obedience to your injunctions I sit down to give you some account of the house-martin or martlet;* and, if my monography of this little domestic and familiar bird should happen to meet with your approbation, I may probably soon extend my inquiries to the rest of the British *hirundines*—the swallow, the swift, and the bank-martin.

A few house-martins begin to appear about the 16th of April; usually some few days later than the swallow. For some time after they appear, the *hirundines* in general pay no attention to the business of nidification, but play and sport about, either to recruit from the fatigue of their journey, if they do migrate at all, or else that their blood may recover its true tone and texture after it has been so long benumbed by the severities of winter. About the middle of

* *Hirundo urbica*, Linnæus.

May, if the weather be fine, the martin begins to think in earnest of providing a mansion for its fam-

House-martins.

ily. The crust or shell of this nest seems to be formed of such dirt or loam as comes most readily to hand, and is tempered and wrought together with little bits of broken straws to render it tough and tenacious. As this bird often builds against a perpendicular wall without any projecting ledge under, it requires its utmost efforts to get the first foundation firmly fixed, so that it may safely carry the superstructure. On this occasion the bird not only

clings with its claws, but partly supports itself by strongly inclining its tail against the wall, making that a fulcrum; and thus steadied, it works and plasters the materials into the face of the brick or stone. But then, that this work may not, while it is soft and green, pull itself down by its own weight, the provident architect has prudence and forbearance enough not to advance her work too fast; but by building only in the morning, and by dedicating the rest of the day to food and amusement, gives it sufficient time to dry and harden. About half an inch seems to be a sufficient layer for a day. Thus careful workmen when they build mud-walls (informed at first perhaps by this little bird) raise but a moderate layer at a time, and then desist; lest the work should become top-heavy, and so be ruined by its own weight. By this method in about ten or twelve days is formed an hemispheric nest with a small aperture towards the top, strong, compact, and warm; and perfectly fitted for all the purposes for which it was intended. But then nothing is more common than for the house-sparrow, as soon as the shell is finished, to seize on it as its own, to eject the owner, and to line it after its own manner.

After so much labour is bestowed in erecting a mansion, as Nature seldom works in vain, martins will breed on for several years together in the same nest, where it happens to be well sheltered and secured from the injuries of weather. The shell or

crust of the nest is a sort of rustic-work full of knobs and protuberances on the outside: nor is the inside of those that I have examined smoothed with any exactness at all; but is rendered soft and warm, and fit for incubation, by a lining of small straws, grasses, and feathers: and sometimes by a bed of moss interwoven with wool. In this nest they tread, or engender, frequently during the time of building; and the hen lays from three to five white eggs.

At first when the young are hatched, and are in a naked and helpless condition, the parent birds, with tender assiduity, carry out what comes away from their young. Were it not for this affectionate cleanliness the nestlings would soon be burnt up, and destroyed in so deep and hollow a nest, by their own caustic excrement. In the quadruped creation the same neat precaution is made use of; particularly among dogs and cats, where the dams lick away what proceeds from their young. But in birds there seems to be a particular provision, that the dung of nestlings is enveloped in a tough kind of jelly, and therefore is the easier conveyed off without soiling or daubing. Yet, as Nature is cleanly in all her ways, the young perform this office for themselves in a little time by thrusting their tails out at the aperture of their nest. As the young of small birds presently arrive at their *ἡλικία*, or full growth, they soon become impatient of confinement, and sit all day with their heads out of the orifice, where the dams, by

clinging to the nest, supply them with food from morning till night. For a time the young are fed on the wing by their parents; but the feat is done by so quick and almost imperceptible a slight, that a person must have attended very exactly to their motions before he would be able to perceive it. As soon as the young are able to shift for themselves, the dams immediately turn their thoughts to the business of a second brood, while the first flight, shaken off and rejected by their nurses, congregate in great flocks, and are the birds that are seen clustering and hovering on sunny mornings and evenings round towers and steeples, and on the roofs of churches and houses. These congregatings usually begin to take place about the first week in August; and therefore we may conclude that by that time the first flight is pretty well over. The young of this species do not quit their abodes all together; but the more forward birds get abroad some days before the rest. These approaching the eaves of buildings, and playing about before them, make people think that several old ones attend one nest. They are often capricious in fixing on a nesting-place, beginning many edifices, and leaving them unfinished; but when once a nest is completed in a sheltered place, it serves for several seasons. Those which breed in a ready-finished house get the start in hatching of those that build new by ten days or a fortnight. These industrious artificers are at their labours in the long days before four in

the morning: when they fix their materials they plaster them on with their chins, moving their heads with a quick vibratory motion. They dip and wash as they fly sometimes in very hot weather, but not so frequently as swallows. It has been observed that martins usually build to a north-east or north-west aspect, that the heat of the sun may not crack and destroy their nests; but instances are also remembered where they bred for many years in vast abundance in a hot stifled inn-yard, against a wall facing to the south.

Birds in general are wise in their choice of situation; but in this neighbourhood every summer is seen a strong proof to the contrary at a house without eaves in an exposed district, where some martins build year by year in the corners of the windows. But as the corners of these windows (which face to the south-east and south-west) are too shallow, the nests are washed down every hard rain; and yet these birds drudge on to no purpose from summer to summer, without changing their aspect or house. It is a piteous sight to see them labouring when half their nest is washed away, and bringing dirt "to patch the ruins of a fallen race"—"generis lapsi sarcire ruinas." Thus is instinct a most wonderful but unequal faculty; in some instances so much above reason, in other respects so far below it! Martins love to frequent towns, especially if there are great lakes and rivers at hand; nay, they even affect the close air of London. And I have not only

seen them nesting in the Borough, but even in the Strand and Fleet Street; but then it was obvious from the dinginess of their aspect that their feathers partook of the filth of that sooty atmosphere. Martins are by far the least agile of the four species; their wings and tails are short, and therefore they are not capable of such surprising turns and quick and glancing evolutions as the swallow. Accordingly, they make use of a placid easy motion in a middle region of the air, seldom mounting to any great height, and never sweeping long together over the surface of the ground or water. They do not wander far for food, but affect sheltered districts, over some lake, or under some hanging wood, or in some hollow vale, especially in windy weather. They breed the latest of all the swallow kind: in 1772 they had nestlings on to October the 21st, and are never without unfledged young as late as Michaelmas.

As the summer declines the congregating flocks increase in numbers daily by the constant accession of the second broods, till at last they swarm in myriads upon myriads round the villages on the Thames, darkening the face of the sky as they frequent the aits of that river, where they roost. They retire, the bulk of them I mean, in vast flocks together about the beginning of October; but have appeared of late years in a considerable flight in this neighbourhood, for one day or two, as late as No-

vember the 3rd and 6th, after they were supposed to have been gone for more than a fortnight. They therefore withdraw with us the latest of any species. Unless these birds are very short-lived indeed, or unless they do not return to the district where they are bred, they must undergo vast devastations somehow, and somewhere; for the birds that return yearly bear no manner of proportion to the birds that retire.

House-martins are distinguished from their congeners by having their legs covered with soft, downy feathers down to their toes. They are no songsters; but twitter in a pretty inward soft manner in their nests. During the time of breeding they are often greatly molested with fleas.

SELBORNE, *Nov.* 20, 1773.

LETTER LVI.

TO THE HONOURABLE DAINES BARRINGTON.

I RECEIVED your last favour just as I was setting out for this place; and am pleased to find that my monograph met with your approbation. My remarks are the result of many years' observations; and are, I trust, true in the whole: though I do not pretend to say that they are perfectly void of mistake, or that a more nice observer might not

make many additions, since subjects of this kind are inexhaustible.

If you think my letter worthy the notice of your respectable society, you are at liberty to lay it before them; and they will consider it, I hope, as it was intended, as a humble attempt to promote a more minute inquiry into natural history; into the life and conversation of animals. Perhaps hereafter I may be induced to take the house-swallow under consideration; and from that proceed to the rest of the British *hirundines*.

Though I have now travelled the Sussex Downs upwards of thirty years, I still investigate that chain of majestic mountains with fresh admiration year by year; and think I see new beauties every time I traverse it. This range, which runs from Chichester eastward as far as Eastbourne, is about sixty miles in length, and is called the South Downs, properly speaking, only round Lewes. As you pass along, it commands a noble view of the wild, or weald, on one hand, and the broad downs and sea on the other. Mr. Ray used to visit a family at Danny, just at the foot of these hills; he was so ravished with the prospect from Plumpton-plain near Lewes, that he mentions those landscapes in his "Wisdom of God in the Works of the Creation" with the utmost satisfaction, and thinks them equal to anything he had seen in the finest parts of Europe.

For my own part, I think there is something

White's sundial, at the bottom of his garden.

peculiarly sweet and pleasing in the shapely figured aspect of chalk-hills in preference to those of stone, which are rugged, broken, abrupt, and shapeless.

Perhaps I may be singular in my opinion, and not so happy as to convey to you the same idea; but I never contemplate these mountains without thinking I perceive somewhat analogous to growth in their gentle swellings and smooth fungus-like protuberances, their fluted sides, and regular hollows and slopes, that carry at once the air of vegetative dilatation and expansion. Or was there ever a time when these immense masses of calcareous matter were thrown into fermentation by some adventitious moisture; were raised and leavened into such shapes by some plastic power; and so made to swell and heave their broad backs into the sky so much above the less animated clay of the wild below?

By what I can guess of the admeasurements of the hills that have been taken round my house, I should suppose that these hills surmount the wild at an average of about the rate of five hundred feet.

One thing is very remarkable as to the sheep: from the westward until you get to the river Adur all the flocks have horns, and smooth white faces, and white legs; and a hornless sheep is rarely to be seen: but as soon as you pass that river eastward, and mount Beeding Hill, all the flocks at once become hornless, or, as they call them, poll-sheep; and have moreover black faces with a white tuft of

wool on their foreheads, and speckled and spotted legs: so that you would think that the flocks of Laban were pasturing on one side of the stream, and the variegated breed of his son-in-law Jacob were cantoned along on the other. And this diversity holds good respectively on each side from the valley of Brambler and Beeding to the eastward, and westward all the whole length of the downs. If you talk with the shepherds on this subject, they tell you that the case has been so from time immemorial; and smile at your simplicity if you ask them whether the situation of these two different breeds might not be reversed? However, an intelligent friend of mine near Chichester is determined to try the experiment, and has this autumn, at the hazard of being laughed at, introduced a parcel of black-faced hornless rams among his horned western ewes. The black-faced poll-sheep have the shortest legs and the finest wool.

[The sheep on the downs in the winter of 1769 were very ragged, and their coats much torn; the shepherds say they tear their fleeces with their own mouths and horns, and they are always in that way in mild wet winters, being teased and tickled with a kind of lice.

After ewes and lambs are shorn, there is great confusion and bleating, neither the dams nor the young being able to distinguish one another as before. This embarrassment seems not so much to

arise from the loss of the fleece, which may occasion an alteration in their appearance, as from the defect of that *notus odor*, discriminating each individual personally; which also is confounded by the strong scent of the pitch and tar wherewith they are newly marked; for the brute creation recognize each other more from the smell than the sight; and in matters of identity and diversity appeal much more to their noses than their eyes. After sheep have been washed there is the same confusion, from the reason given above.]—OBSERVATIONS ON NATURE.

As I had hardly ever before travelled these downs at so late a season of the year, I was determined to keep as sharp a look-out as possible so near the southern coast, with respect to the summer short-winged birds of passage. We make great inquiries concerning the withdrawing of the swallow kind, without examining enough into the causes why this tribe is never to be seen in winter; for, *entre nous*, the disappearing of the latter is more marvellous than that of the former, and much more unaccountable. The *hirundines*, if they please, are certainly capable of migration; and yet no doubt are often found in a torpid state: but redstarts, nightingales, whitethroats, blackcaps, which are very ill provided for long flights, have never been once found, as I ever heard of, in a torpid state, and yet can never be supposed in such troops from year to year to dodge and elude the eyes of the curious and inquisitive,

which from day to day discern the other small birds that are known to abide our winters. But, notwithstanding all my care, I saw nothing like a summer bird of passage: and, what is more strange, not one wheatear, though they abound so in the autumn as to be a considerable perquisite to the shepherds that take them; and though many are to be seen to my knowledge all the winter through in many parts of the south of England. The most intelligent shepherds tell me that some few of these birds appear on the downs in March, and then withdraw to breed probably in warrens and stone quarries: now and then a nest is ploughed up in a fallow on the downs under a furrow, but it is thought a rarity. At the time of wheat-harvest they begin to be taken in great numbers; are sent for sale in vast quantities to Brighton and Tunbridge; and appear at the tables of all the gentry that entertain with any degree of elegance. About Michaelmas they retire, and are seen no more till March. Though these birds are, when in season, in great plenty on the south downs round Lewes, yet at Eastbourne, which is the eastern extremity of those downs, they abound much more. One thing is very remarkable—that though in the height of the season so many hundreds of dozens are taken, yet they never are seen to flock; and it is a rare thing to see more than three or four at a time: so that there must be a perpetual flitting and constant progressive succession. It does not

A rookery.

appear that any wheatears are taken to the westward of Houghton bridge, which stands on the river Arun.

I did not fail to look particularly after my new migration of ring-ousels; and to take notice whether they continued on the downs to this season of the year; as I had formerly remarked them in the month of October all the way from Chichester to Lewes wherever there were any shrubs and coverts; but not one bird of this sort came within my observation. I only saw a few larks and whinchats, some rooks, and several kites and buzzards.

About summer a flight of crossbills comes to the pine-groves about this house, but never makes any long stay.

The old tortoise, that I have mentioned in a former letter, still continues in this garden; and retired under ground about the 20th of November, and came out again for one day on the 30th: it lies now buried in a wet swampy border under a wall facing to the south, and is enveloped at present in mud and mire!

Here is a large rookery round this house, the inhabitants of which seem to get their livelihood very easily; for they spend the greatest part of the day on their nest-trees when the weather is mild. These rooks retire every evening all the winter from this rookery, where they only call by the way, as they are going to roost in deep woods: at the dawn

of day they always revisit their nest-trees, and are preceded a few minutes by a flight of daws, that act, as it were, as their harbingers.

RINGMER, *near* LEWES, *Dec.* 9, 1773.

FAMILIAR FLOWERS OF FIELD AND GARDEN. By F. SCHUYLER MATHEWS. Illustrated with 200 Drawings by the Author, and containing an elaborate Index showing at a glance the botanical and popular names, family, color, locality, environment, and time of bloom of several hundred flowers. 12mo. Library Edition, cloth, $1.75; Pocket Edition, flexible covers, $2.25.

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"I have examined Mr. Mathews's little book upon 'Familiar Flowers of Field and Garden,' and I have pleasure in commending the accuracy and beauty of the drawings and the freshness of the text. We have long needed some botany from the hand of an artist, who sees form and color without the formality of the scientist. The book deserves a reputation."—*L. H. Bailey, Professor of Horticulture, Cornell University.*

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